The Second International Conference
College of Medicine
Hawler Medical University

22nd - 24th November, 2017, Divan Hotel - Erbil - Kurdistan, Iraq

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Welcome Note

On behalf of the executive committee of The Second International Conference - College of Medicine - Hawler Medical University which is going to be held from 22nd – 24th November 2017, in Divan Hotel - Erbil, we would like to welcome and invite you to participate in all activities of this conference.

We are pleased to host such an event that gives you the opportunity to meet colleagues from many countries and provides an environment to share new experiences, and exchange update knowledge on many issues.

This conference will be one of the most important medical conferences in the region covering all the specialties and hosting several well-known international and local speakers to discuss updates related to each medical field and specialty.

Your participation by attending the conference and submitting your abstracts will enrich the value of the conference.

Erbil is a city of peace where all the different religions, nationalities and creeds live together peacefully. The multi-language and cultural civilization of population is clearly very different in Erbil city.

We are confident that this conference will exceed your expectations, offering an exciting scientific event as well as enjoyable social program and cultural experience.

Best regards.

Prof. Ali Al Dabbagh
President of the Conference
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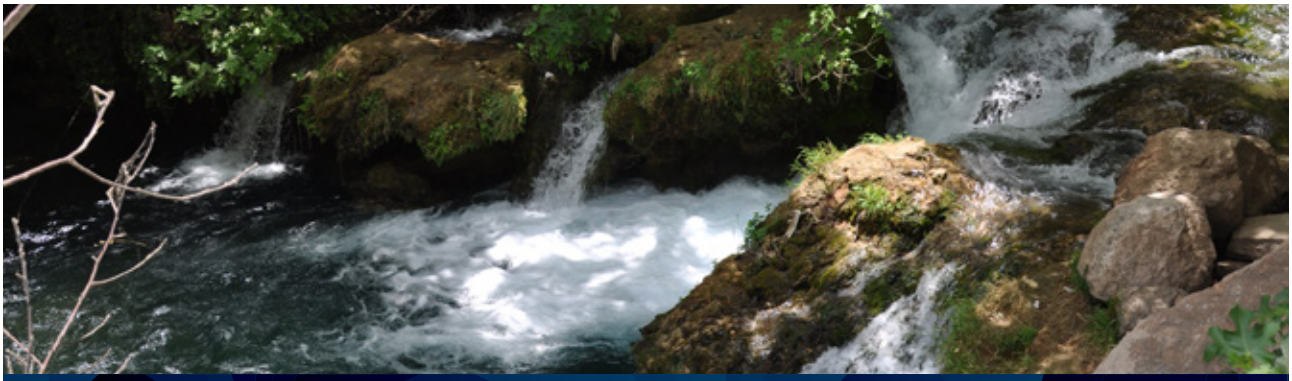

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Conference Proceeding

Content

Catheter Ablation of Common Atrioventricular Nodal Reentry Tachycardia (AVNRT) using the Conventional Method

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Abstract

Background: Catheter Ablation of Common Atrioventricular Nodal Reentry Tachycardia is the commonest type of Supraventricular Tachycardia referred to the Electrophysiology lab and it constitutes about 70% of the arrhythmias admitted to the Emergency Department. The mechanism of Catheter Ablation of Common Atrioventricular Nodal Reentry Tachycardia is reentry where the slow pathway sited at the lower posterior region of Koch's triangle near the coronary sinus orifice while the fast pathway higher up near the His bundle at the antero superior aspect of Koch's triangle. The catheter ablation becoming first line therapy in drug refractory cases and may be first option before drug treatment according to the patient preference or the hemodynamic deterioration due to the Supraventricular Tachycardia.

Patients and Methods: Seventy patients with Catheter Ablation of Common Atrioventricular Nodal Reentry Tachycardia were selected from a total Supraventricular Tachycardia cases of 106 patients referred to the Catheter lab for ablation. Standard technique for Electrophysiological study done to induce the tachycardia. Three Electrophysiological catheters used in 90% of cases which include RA, His, RV and a fourth catheter introduced at the CS in 10% of the cases. Atrial programmed stimulation with S1 400msc, S2 300-230 and S3 of 250-220msc used to induce the Supraventricular Tachycardia in 85% of the cases and ventricular programmed stimulation in 15% of the cases. Differentiation of the AVNRT from Atrial Tachycardia and Atrio Ventricular Tachycardia done by ventricular entrainment where the PPI-TCL more than 115msc considered supportive of Catheter Ablation of Common Atrioventricular Nodal Reentry Tachycardia and the pattern post VP is VAV where AT is excluded. Dry ablation catheter of 4 mm tip used to modify the SP near the CS OS .The appearance of JR or JBs was a sign of effective application of the RF. The success of ablation was indicated by failure to induce the tachycardia with A and VPS. The success rate was 90% with 4 years follow up and the recurrence rate was 5%. Complete Heart Block developed in 3% who needed Permanent Pacemaker. The average total procedure time 45minutes and fluoroscopy time average 5 minutes.

Results: Catheter ablation was considered in drug refractory patients only in 57% of cases and in 22% in markedly symptomatic patient the RF ablation was first line therapy and in 22% in patient preference. The low complication rate and the high success rate make the procedure first line therapy in 75% of cases which may increase with more patient preference of the procedure over drug therapy.

Conclusion: Catheter radiofrequency catheter ablation therapy is becoming technically easy, safe and reliable as first line treatment in the majority of patients with Catheter Ablation of Common Atrioventricular Nodal Reentry Tachycardia.

Key words: Atrioventricular nodal reentry tachycardia, catheter ablation

Introduction

Atrioventricular nodal reentry tachycardia (AVNRT) is the most common form of regular narrow complex tachycardia (RNCT) referred to the catheter laboratory for ablation therapy[1]. AVNRT more commonly occurs in patients without structural heart disease, it is more common in females than males.[1,2] . The mechanism of AVNRT is reentry using two pathways one is slow and the other is fast , they are anatomically located at the triangle of Koch at the right atrium, the fast is close to the His bundle while the slow is just above the coronary sinus os [3-5] . The slow pathway is the antegrade conducting pathway and the fast is the retrograde conducting in the common type of AVNRT which is labeled accordingly as the slow/fast (s/f) type while the uncommon type is characterized by the fast pathway is conducting antegradely and the slow one conducting retrogradely and called fast/slow (f/s) type .[1,2] The superficial Electrocardiographic features of AVNRT are: 1, RNCT.2, either no P' seen where it is embedded within the QRS or P' seen just after the QRS as a pseudo r wave in V1 and aVR and /or pseud s in leads II,II and aVF [2] , Figure 1.

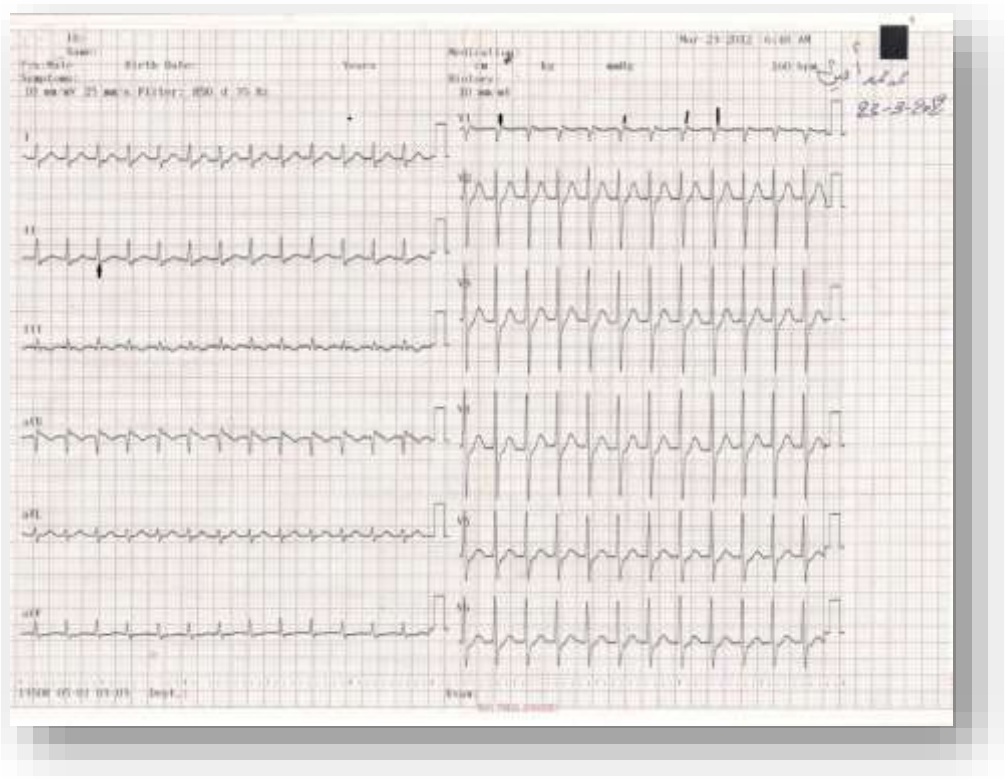

Figure 1. Twelve leads ECG of SVT showing RNCT of short RP long PR type and pseudo r wave at V1 and aVR and pseudo s wave at lead II (arrows) . These features suggesting common s/f type AVNRT.

The electrophysiological characteristics include: 1, AH interval jump during atrial programmed stimulation and induction of the tachycardia.2, during SVT a short VA interval less than 80msc. 3, with ventricular over drive stimulation (ventricular entrainment) during the SVT a VAV pattern seen with a post pacing interval (PPI) –Tachycardia Cycle length (TCL) is more than 118msc. [2] Figure 2.

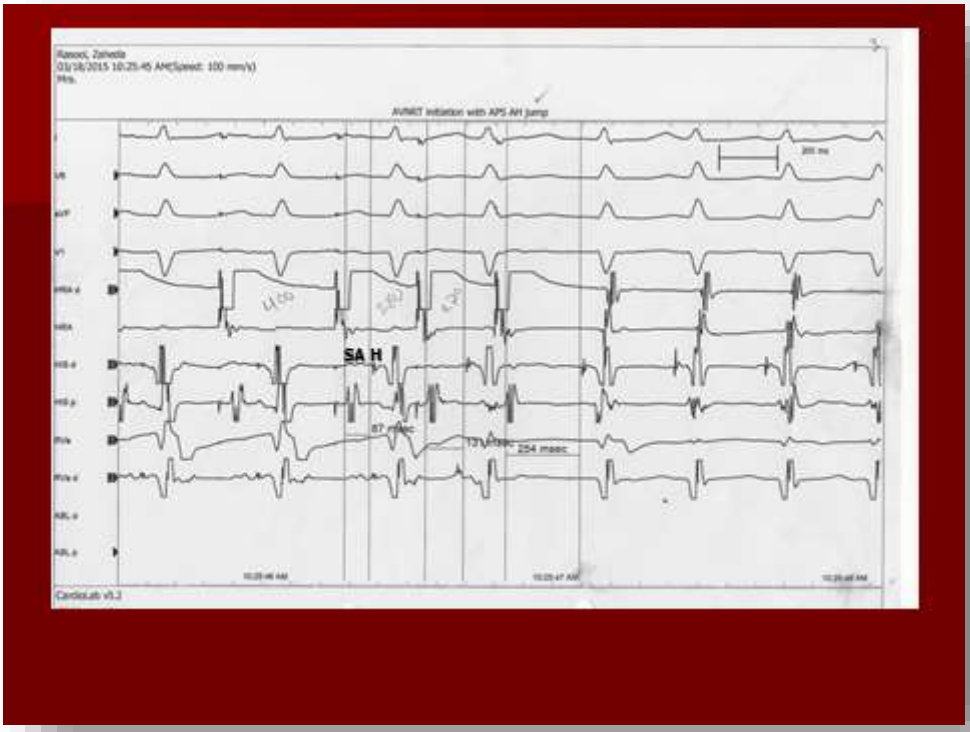

Figure 2. The EP trace shows atrial programmed stimulation where AH interval jump is followed by SVT induction, this is highly suggesting AVNRT s/f type. The speed of recording is 100mm/sec.

Catheter radiofrequency catheter ablation therapy (CRFAT) targeting the fast or the slow pathway has been used for more than two decades. [3-6] The slow pathway ablation became the most widely used. [1,2] In Iraq the first slow pathway CRFAT was done at Kadhymia teaching hospital in the year of 2001 and at Nasiriya Heart Centre in the year of 2007. [7] In Kurdistan it was done in the year of 2011 at Alhassani cardiac center at Sulaimanya. More recently more cases are done using the new system of Cartoo and the Ensite at Najaf and Nasiriya heart centers.

Patients and Methods

From November 2011 up till December 2017, a total of 106 patients with SVT referred to the catheter lab at Alhassani cardiac center. Seventy patients who fulfilled the criteria of AVNRT were included in this study. The mean age of the patients was 46.8+-15 years (range 24-55Y.). Sixty patients were females and 10 patients were males. The main symptoms they presented with were palpitation in 100%, dizzy spells encountered in 35% and pre syncope in 2 patients. The indication of CRFAT was drug inefficacy in 40 patients and as first line therapy in 30 patients. In 15 patients RF ablation was first line therapy because of severe symptoms and in 15 was due to patient preference for ablation versus drug therapy. All patients underwent basic 12 leads electrocardiogram (ECG) and

all available ECGs during tachycardia and sinus rhythm were carefully inspected for the ECG signs suggesting AVNRT. Basic blood biochemistry, thyroid function tests and chest X ray (CXR) were done. Electrophysiological study (EPS) was done using conventional EP System, GE Medical Systems CardioLab v5.2 and Bloom cardiac stimulator with Boston Scientific (BS) ablation generator. All antiarrhythmic drugs omitted for a period of at least 14 days before the EPS. Skin sterilization and then 2% Xylocaine used for local anesthesia of the left and right inguinal area for femoral veins (FV) approach where triport 14 F sheaths introduced on the right FV and 7F sheath at the left FV. Under fluoroscopy, three Qudripolar EP catheters from Boston Scientific (BS) or Access Point Technology (APT) introduced through the right femoral vein sheath and positioned at the RA, His and RV apex subsequently. Figure 3.

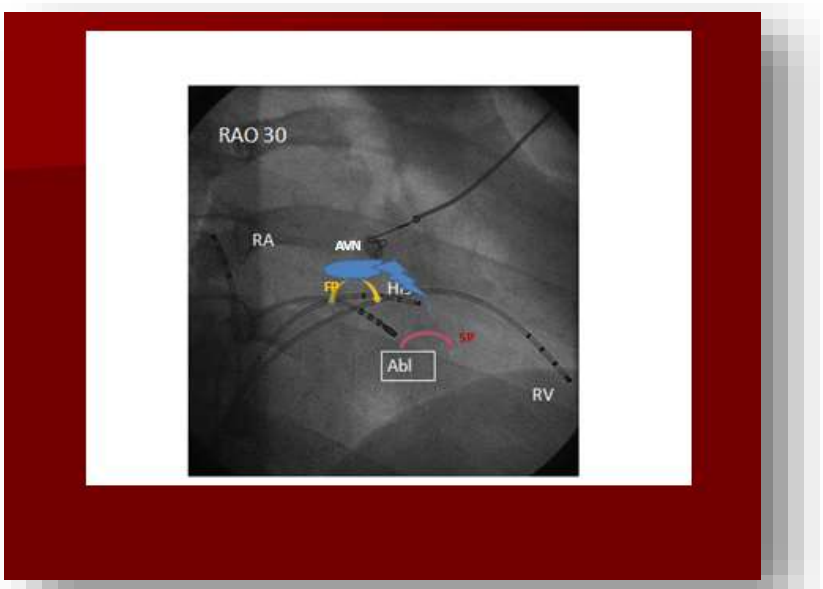

Figure 3, X ray showing the EP and ablation catheters position in correlation to the slow and fast pathway site.

In few patients' coronary sinus catheter introduced if deemed necessary. Basic conduction measurements done and then induction of the arrhythmia attempted with atrial programmed stimulation (APS) and when AH interval jump observed this indicate dual AV nodal physiology. Ventricular programmed stimulation (VPS) used if the SVT is not induced by APS. The induced SVT is diagnosed as s/f AVNRT if the followings criteria seen: 1, AH jump of more than 50msc with reducing the APS pacing cycle length of 10msc .2, VA interval during SVT is less than 80msc. 3, with ventricular entrainment (ventricular stimulation during the SVT) VAV pattern seen after cessation of VPS and PPI minus TCL more than 118msc. Figures 3.

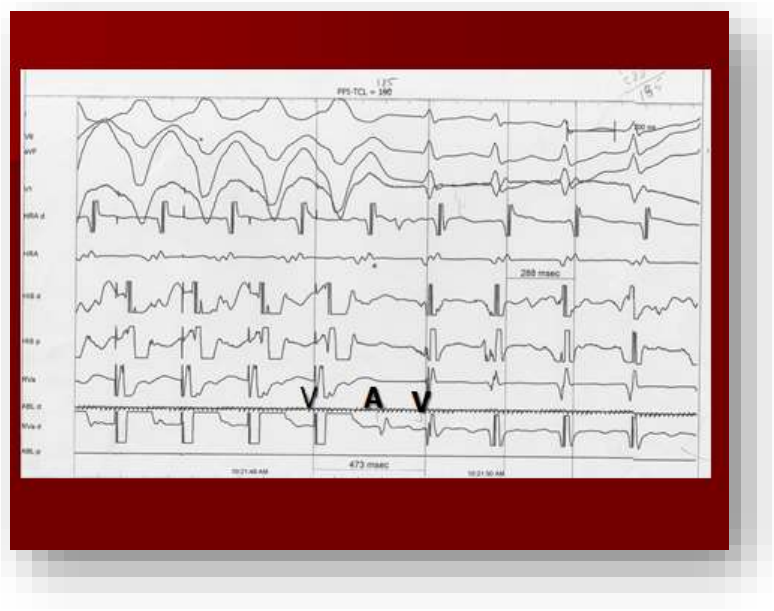

Figure 3, Ventricular entrainment maneuver during the SVT showing PPI-TCL of 185msc and VAV pattern , suggesting s/f AVNRT and excluding AT & AVRT. The speed of recording is 100mm/second.

Atypical (f/s) AVNRT are not included in this study. AT and AVRT are excluded through the ventricular entrainment maneuver mentioned above. The SVT was terminated by APS after confirming the diagnosis of s/f AVNRT. Radiofrequency Catheter ablation procedure: After confirming the diagnosis of common s/f AVNRT done by EP study, a 4mm tip dry ablation catheter from BS or APT introduced through the left femoral sheath and positioned at the lower posterior part of Koch triangle just above the CS os where the SP is sited. Ablation always done during sinus rhythm and no ablation done during the SVT. Once a satisfactory anatomical position achieved through RAO and LAO fluoroscopy view and once an Electrocardiogram (EGM) trace at the distal pole of the ablation catheter showed an A to V ratio of 1/5-10 with or without slow pathway potential, the RF delivery started with temperature control mode and delivering 35 Watt for 1 minute to achieve a temperature of 60-70 degree centigrade. Main sign of successful RF delivery is the appearance of junctional rhythm (JR) which if not appeared within 10 seconds RF delivery will be stopped and a better position of the ablation distal pole achieved. If quite fast JR appeared and VA block seen RF delivery is stopped immediately to avoid the occurrence of AV block. Figure 4.

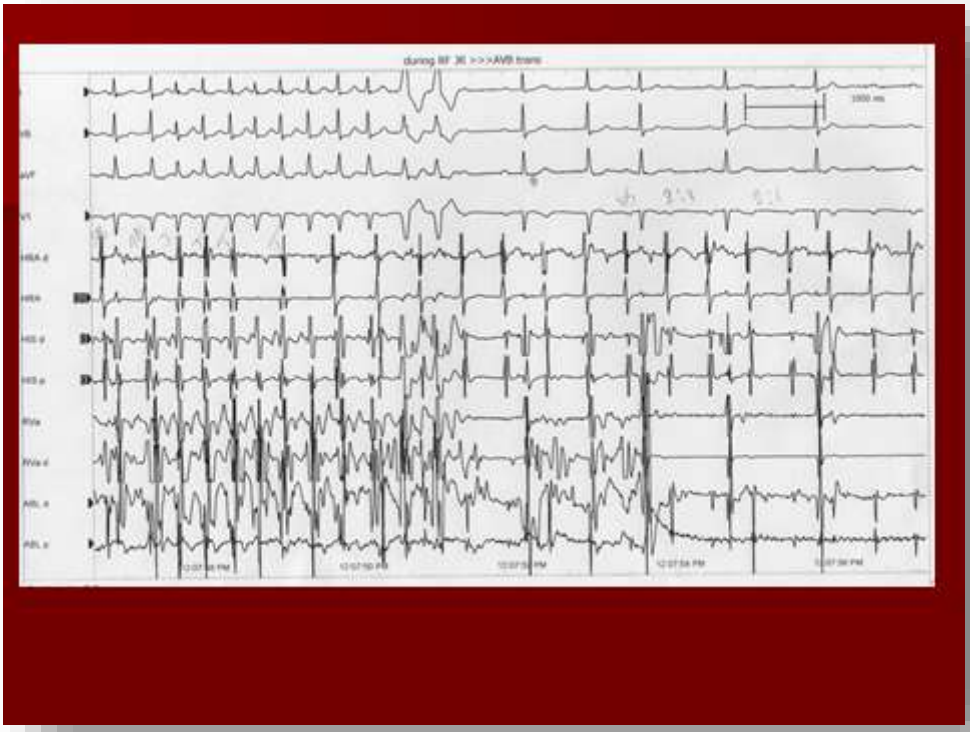

Figure 4, The appearance of fast junctional rhythm and transient AV block with the RF application. The speed of recording is 25mm/sec.

Slow JR is a good sign of effective RF delivery and successful SP ablation. The end point of ablation is non inducibilty of the AVNRT with APS and VPS without and without Isuprnaline infusion. The author reports no conflict of interest.

Results

Among the 70 patients included in this study 68 (97%) patients had acute success with non inducibilty of the tachycardia at the end of the ablation procedure. In two patients the procedure failed and the tachycardia still inducible after ablation where a left sided SP was suspected. In one patient fast pathway ablation resulted in success and non inducibilty of the VT but a first degree heart block developed with a PR interval of 240msc and prolonged AH interval of 185msc but a normal HV interval. Complete atrio-ventricular (AVB) block occurred in 3 patients, in two of them the AVB persisted and permanent pacemaker implanted and in one patient the AVB resolved within 24 hours. The average procedure time was 72+- 21 minutes and fluoroscopy time was 10+- 5.4 minutes. The follow up period ranged from 1.5-6 years. There was a recurrence in two patients after 6 months and one year in both a second ablation done and followed for 2 years with no recurrence. All patients discharged from the hospital in the same day within 4-8 hours after the procedure and they are advised to rest for 24 hours after which they can resume normal daily life activities.

Discussion

AVNRT of s/f type accounts about 85% of the AVNRT and 75% of the RNCT seen in the ED or the cath lab. The presenting symptomatologies previously described by Wood were palpitation in 96%, dizziness in 75%, dyspnea in 47%, and syncope in 0.5%. [8] We noticed palpitation in 100%, dizziness in 35%, and syncope in 20% and dyspnea in 40 %. AVNRT is commonly seen in structurally normal heart but patients with structural heart disease occasionally develop AVNRT. In our series only three patients (4%) have previous IHD. While in other's series structural heart disease seen in 6-19%. [8-11] The typical s/f type is far more common than the uncommon f/s type.[10-12]. In our series only s/f type are included. The treatment of AVNRT depends on the effect of the tachycardia on the hemodynamics and life activities of the patient. Findings a cure has always been the main goal of therapy. [11-13]. Drug treatment might be effective in minority of patients but it has to be lifelong therapy with all the possible side effects .Patient compliance to drug therapy, the drugs side effects and the cost are the three main limiting factors for the life lasting drugs therapy. When ablation therapy first used by delivering DC shock or open heart surgery ablation it gave a hope for a future easier, safer and highly effective ablation procedure and that is when CRFAT came over and the energy source with RF became so well controlled and refined the ablation results became highly encouraging to achieve total cure of many arrhythmias and on the top of the list is the AVNRT. The excellent outcome of ablation is mainly due to the development of anatomical and electrical mapping procedures and precisely defining the slow pathway ablation site. [14, 15, 16] To achieve high success rate in AVNRT ablation we need: 1, well set EP and ablation generator systems. 2, trained medical and technical staff. 3, Reliable X ray fluoroscopy set up with RAO and LAO projection. 4, EP and ablation catheters. We started with self-training program locally at Kadhymia teaching hospital, Nasiriya heart center and then at Alhassani cardiac center in Sulaimanya where the cases included in this study. Our acute success rate was 98% and the long term success was 100% where in two patients recurrence occurred and needed another SP ablation where no recurrence within two years follow up . The reported recurrence rate ranges from 3-6% [5, 18-22] . Complete atrio ventricular block (AVB) developed in three patients, in two permanent pacemaker was implanted and in one the AVB resolved after 24 hours, these results are comparable to other series. [16] The appearance of junctional rhythm during RF delivery is considered a marker of effective RF delivery and then as a successful ablation by many authors. [17, 18-20]. However the absence of JR does not increase the risk of recurrence of the AVNRT but technically it indicate non effective RF delivery .[5, 21-22] CRFAT improves health related quality of life to a greater extent than do medications and cost wise it is less expensive therapy compared to long life lasting drug therapy among patients who have 1-2 attacks of SVT per month. [17, 18]

Conclusion: CRFAT is both safe and effective supporting our and other author's suggestion to consider it as first line therapy for the majority of patients with AVNRT unless the patient prefers drug therapy trial before CRFAT.

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LIFESTYLE AND SATISFACTION WITH TREATMENT IN PATIENTS WITH TYPE 2 DIABETES MELLITUS IN SULAIMANI CITY

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ABSTRACT

Background and Objectives: Diabetes mellitus is a group of metabolic disorders of carbohydrate metabolism in which glucose is underutilized, producing hyperglycemia & changes in lipid profile. The aim of the study was to find out lifestyle and degree of satisfaction with treatment in patients with type 2 diabetes mellitus in Sulaimani city.

Methods: A cross sectional study was done in the diabetic and endocrine center from 1st of May 2015 to 28th of May 2016, a convenient sample of 300 patients involved, all of them had Type 2 diabetes; data analyzed by Statistical package for social science version 21 Program. Chi square test used to get the association and p-value equal or less than 0.05 was considered as significant.

Results: Three hundred patients were involved in this study their age between 28-89 years. Highest percentage was among female 157(52.3%), DM duration of 1-5 years (39%) and satisfied with currently treatment (50. 6%).A significant association between age, level of education and residency with treatment satisfaction scores was found, p-value (0.01) , (<0.001), (0.019) respectively.

Conclusion: Most of the participants were females, illiterate, married, housewives, from inside city center, of moderate economic status and satisfied with their currently treatment. A significant association between age, level of education and residency with treatment satisfaction scores was found.

Key Word: Life style. Satisfaction, DM, Sulaimani

Introduction

Diabetes mellitus (DM) is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces [1,2]. Diabetes is a disease with a large and increasing societal cost due to the number of people affected worldwide and its associated complications, such as increased risk of cardiovascular disease, neuropathy, and eye complications. For patients with type 2 diabetes, weight control, by means of dietary and physical activity regimens, is the cornerstone of the treatment[3,4]. The Criteria for Diabetes Diagnosis are: FPG ≥126 mg/dL (7.0 mmol/L). 2-hr PG ≥200 mg/dL (11.1 mmol/L) during OGTT (75-g). A1C ≥6.5% (48 mmol/mol). Random PG ≥200 mg/dL (11.1 mmol/L) [5].Lifestyle characteristics, such as physical activity, diet, and stress are important factors that influence development and prognosis of type 2 diabetes [6]. Changes in diet and increase in physical activity and exercise are key components of the management of type 2 diabetes[7], and guidelines recommend changes in these lifestyle characteristics for both prevention and management of the disease [8]. According to the American Diabetes Association and the European Association for the Study of Diabetes, first-line treatment for the management of hyperglycemia in patients with T2DM consists of changes in lifestyle plus metformin; second-line treatment consists of changes in lifestyle plus metformin and sulfonylurea [9,10]. Routine assessment of patient satisfaction with treatment, and the resultant treatment tailoring, is an important step toward building and maintaining a therapeutic alliance among the patient and family [11]. Because there are potentially multiple aspects of a patient's experience and preferences for treatment to consider, verbally asking the patient questions about their treatment might not elicit an accurate report on the nature or type of difficulties experienced as is possible with the combined use of tested and validated items[12]. A widely-used diabetes specific measure, the Diabetes Treatment Satisfaction Questionnaire (DTSQ) has performed well in measuring patients' treatment satisfaction for diabetes therapies[13,14]. Providing a brief assessment of qualities of diabetes treatment satisfaction of convenience, well-being and blood glucose control. It does not include an extended range of issues or concerns, such as side effects, dosing schedules which may vary across agents, time spent managing diabetes, and integrating medication regimens into one's lifestyle or routine [15,16].

The main objectives of this study are: To identify the socio-demographic status of the participants, to find out way of life among type 2 diabetes, to assess the degree of satisfaction with the treatment of patients with type 2 diabetes mellitus, and to find out association between treatment satisfaction and socio-demographic characteristics of diabetic patients.

Material And Methods

A cross sectional study was conducted among type 2 diabetes patients attending Sulaimani center for endocrine and diabetes diseases, from 1st of May 2015 to 31th December 2015. A convenient sample of 300 type 2 diabetes mellitus aged ≥18 years were enrolled in the study. The questionnaire included socio-demographic status, smoking and alcohol consumption habits, medical history, family history of diabetes, dietary information, other lifestyles ,investigations and treatment satisfaction questionnaire (WHO Diabetes Treatment Satisfaction Questionnaire DTSQ). The BMI was calculated as weight in kilograms divided by squared height in meter, conventional BMI cut-off points were applied to classify the study populations into[17]: Underweight (BMI < 18.5 kg/m²).Normal (BMI 18.5-24.9 kg/m²).Overweight (BMI 25-29.9 kg/m²).Obesity (BMI 30-39.9 kg/m²). Morbid obesity (BMI ≥40 kg/m²). The WHO-Diabetes Treatment Satisfaction Questionnaire DTSQ is an eight-item questionnaire, scored on a scale of 0-6, This tool has been identified by the World Health Organization and the International Diabetes Foundation as useful in assessing outcomes of diabetes care [18,19] the detail of it as following: For the first item; zero means very dissatisfied with the current treatment, one means dissatisfied (in the table we mixed them as 0-1 dissatisfied), 2-4 moderately satisfied, five satisfied, while six means very satisfied with the current treatment (in the table we mixed them as 5-6 high satisfied). For the second and third items, zero means never felt; regarding unacceptably high or low blood sugar in a week; while six means all of the time felt that. For the fourth item, zero means very inconvenient regarding how convenient are the patient to be with his or her treatment recently; one means inconvenient (in the table we mixed them as 0-1 inconvenient), 2-4 moderately convenient, five convenient, while six means very convenient (in the table we mixed them as 5-6 very convenient). For the fifth item, zero means very inflexible regarding how flexible are the patient with his or her treatment recently; one means inflexible (in the table we mixed them as 0-1 inflexible), 2-4 moderately flexible, five flexibles, while six means very flexible (in the table we mixed them as 5-6 high flexible). For the sixth item, zero means very dissatisfied regarding how satisfied the patient are to be with understanding of diabetes; one means dissatisfied (in the table we mixed them as 0-1 dissatisfied), 2-4 moderately satisfied, five satisfied, while six means very satisfied (in the table we mixed them as 5-6 high satisfied). For the seventh item, zero means no I would definitely not recommend regarding are the patient recommend this form of treatment to someone else with his or her kind of diabetes; one means not recommend (in the table we mixed them as 0-1 not recommend), 2-4 moderately recommend, five recommend, while six means yes I would recommend (in the table we mixed them as 5-6 high recommend). For the eighth item, zero means very dissatisfied regarding how satisfied the patient are to be continue with the present form of treatment; one means dissatisfied (in the table

we mixed them as 0-1 dissatisfied), 2-4 moderately satisfied, five satisfied, while six means very satisfied (in the table we mixed them as 5-6 high satisfied). Data analyzed using Statistical Package for the Social Science (SPSS) version 21.0 program. Chi square and fisher exact test to get the association P-value equal or less than 0.05 was considered significant.

Results

Table (1) shows the highest frequency was among those their age more than 50 years (64%), females (52.3%), married (96.7%), housewife (44%), inside city center (78.7%), and moderate socio-economic state (88.3%).

Table 1: Socio-demographic characteristics of the study sample.

Socio-demographic	Variables	No.	%
Age in year	≤50	108	36
	>50	192	64
Gender	Female	157	52.3
	Male	143	47.7
Marital status	Married	290	96.7
	Widow	10	3.3
Occupation	Employed	82	27.3
	Free worker	65	21.7
	Students	1	.3
	Housewife	132	44.0
	Retired	20	6.7
Residency	Inside city center	236	78.7
	Outside city center	64	21.3
economical level	Low	23	7.7
	Moderate	265	88.3
	High	12	4.0
Total		300	100

Figure (1) Distribution of the study sample by level of education. Illiteracy was the highest percentage (32%), then primary school (27%), secondary school (18.3%), university and institute (16.3%), and those who can read and write accounts (6.3%).

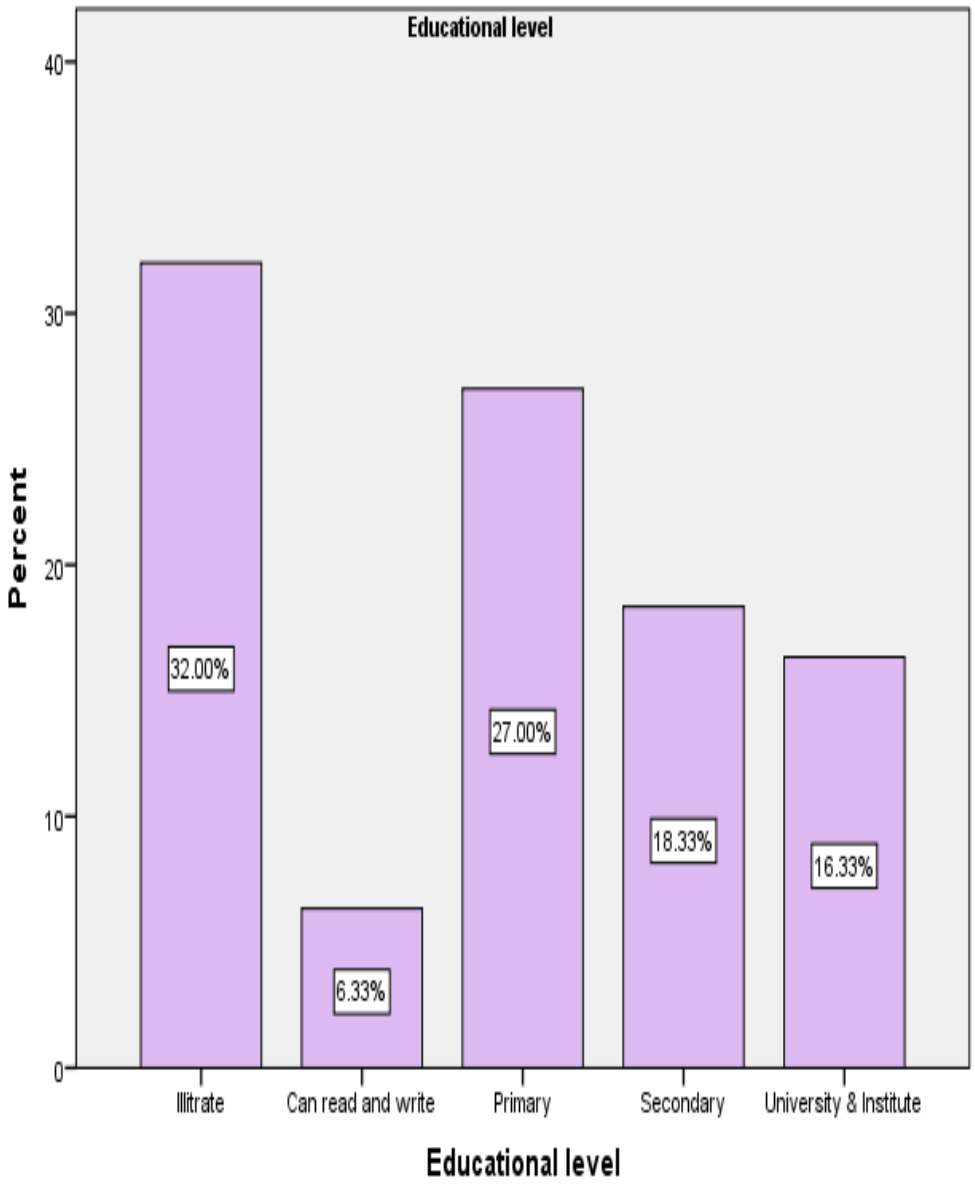

Figure (1) Distribution of the study sample by level of education.

Table (2) Regarding smoking habit the highest frequency was among none smokers (70.7%), none passive smoking (46.3%), and those smoke more than one pack per day (18.3%). For the alcohol consumption habits the highest frequency among none alcoholic (91.3%), and those who consume alcohol on occasion (5%).

Table 2: Smoking and alcohol drinking habits among study participants.

Variables		No.	%
Smoking	Yes	88	29.3
	No	212	70.7
Passive Smoking (n=212)	Yes	73	24.3
	No	139	46.3
Number of Cigarette / day; groups (n=88)	0 (<10 cigarettes)	5	1.7
	1 (10-20 cigarettes)	28	9.3
	2 (> one pack)	55	18.3
Alcohol	Yes	26	8.7
	No	274	91.3
Duration of alcohol consumption (n=26)	one time / week	1	0.3
	2-4 times / week	1	0.3
	Every night	9	3.0
	on occasion	15	5.0

Table (3) Regarding the duration of diabetes mellitus in year the highest frequency was among those who have diabetes duration of 1-5 years (39%). About (66%) of patient had family history of diabetes compared to (34%) who do not have family history. Highest frequency among those who do not use insulin at all (81.3%). For those use insulin, highest frequency among those who use insulin twice daily (14.7%). Majority of patient used oral hypoglycemic (98.7%). And overweight (BMI 25-29.9 kg/m^2) was the highly prevalent among diabetes (52.3%).

Table 3: Clinical characteristics of DM of the study participants.

Variables		No.	%
Duration of DM in years	1 year	81	27.0
	1-5 years	117	39.0
	More than 5 years	102	34.0
Family history of DM		5	1.7
	Children	82	27.3
	Parents	1	.3
	Grandparents	63	21.0
	Brothers	47	15.7
	Sisters	102	34.0
	None		

Insulin use	Yes	56	18.7
	No	244	81.3
Number of insulin use / day (n= 56)	1	12	4.0
	2	44	14.7
	Not use insulin	244	81.3
Oral hypoglycemic use	Yes	296	98.7
	No	4	1.3
BMI	<18.5 kg/m²	1	0.3
	18.5-24.9 kg/m²	27	9.0
	25-29.9 kg/m²	157	52.3
	30-39.9 kg/m²	111	37.0
	≥ 40 kg/m²	4	1.3
Total		300	100.0

Table (4) shows those who eating meat once per week was (40%), for eating poultry the highest proportion was among those who eat poultry four to six times per week (36.3%). Regarding eating fish the highest percentage was among those who eat fish once per week (33.3%).

Table 4: Meat, poultry and fish eating habits of the participants.

Variables	Duration	No	%
How often eat red meat			
	Not eat meat	58	19.3
	4-6 /W	9	3.0
	2-3/W	58	19.3
	once weekly	120	40.0
	1-3 / Month	55	18.3
How often eat poultry			
	Daily	26	8.7
	4-6 /W	109	36.3
	2-3/W	95	31.7
	once weekly	61	20.3
	1-3 / Month	9	3.0

How often eat fish			
	4-6 /W	4	1.3
	2-3/W	64	21.3
	once weekly	100	33.3
	1-3 / Month	75	25.0
	Never	57	19.0
Total		300	100.0

Table (5) Regarding the frequency of eating vegetables the highest proportion was among those who eat vegetables daily (73.7%), eat fruits one to two per day (47%) same percentage for those who never eat fruits, regarding exercise habit the highest frequency among those who never do exercise (80.3%), and about (66%) who use salt in the food.

Table 5: Eating vegetable, fruit, salt and exercise habits of the participants.

Variables	Duration	No.	%
How often eat Vegetables	Daily	221	73.7
	4-6 /W	62	20.7
	2-3/W	9	3.0
	once weekly	3	1.0
	1-3 / M	5	1.7
How many eat fruit?	5 or more/day	5	1.7
	3-4 / day	13	4.3
	1-2 / day	141	47.0
	Never	141	47.0
How often exercise / week	No	241	80.3
	2 /week	15	5.0
	3/ week	22	7.3
	4/ week	21	7.0
	7/ week	1	0.3
Salt intake	Yes	198	66.0
	No	102	34.0
Total		300	100.0

Table (6) shows the distribution of the sample according to the diabetic treatment satisfaction questionnaire (DTSQ). Regarding the satisfaction with current treatment, (50.6%) were highly satisfied. Nearly (85%) were dissatisfied about their unacceptably high blood sugar recently, compared to (15%) that were moderately satisfied. And around (97%) were dissatisfied about their unacceptably low blood sugar recently. Regarding convenience with treatment recently, the highest proportion were moderately convenient (79.3%). For the recent flexibility of the treatment, the highest percentage showed moderately flexibility (49.4%). Understanding diabetes mellitus as a disease, (49.1%) showed moderately satisfied. For the recommendation of this form of treatment,

(56.1%) moderately recommend it, and for the continuation of the present form of treatment (64.3%) moderately recommend this.

Table 6: Diabetic treatment satisfaction of the participants according to DTSQ.

Variable		No.	%
Satisfaction with current treatment			
Dissatisfied	(0-1)	1	.3
Moderately satisfied	(2-4)	146	48.7
Satisfied	(5-6)	152	50.6
How often have you felt your blood sugars have been unacceptably high recently?			
Not felt	(0-1)	254	84.7
Moderately felt	(2-4)	45	15.0
How often have you felt that your blood sugars have been unacceptably low recently?			
Not felt	(0-1)	292	97.3
Moderately felt	(2-4)	7	2.4
How convenient have you been your treatment to be recently?			
Inconvenient	(0-1)	3	1.0
Moderately convenient	(2-4)	238	79.3
Convenient	(5-6)	58	19.3
How flexible have you been finding your treatment to be recently?			
Inflexible	(0-1)	4	1.3
Moderately flexible	(2-4)	148	49.4
Flexible	(5-6)	147	49.0
How satisfied are you with your understanding of your diabetes?			
Dissatisfied	(0-1)	7	2.3
Moderately satisfied	(2-4)	147	49.1
Satisfied	(5-6)	145	48.3
Would you recommend this form of treatment to someone else with your kind of diabetes?			
Not recommend	(0-1)	2	0.7
Moderately recommend	(2-4)	168	56.1
Recommend	(5-6)	129	43
How satisfied would you to be continue with your present form of treatment?			
Dissatisfied	(0-1)	2	0.7
Moderately satisfied	(2-4)	193	64.3
Satisfied	(5-6)	104	34.7
Total		299	99.0

Table (7) Regarding age in year, highest percentage was among those above 50 years of age and moderately satisfied (71.6%) p-value (0.01) ,for the gender, highest frequency among female and satisfied 92 (58.6%) p-value (0.287), married and satisfied 174 (60.6%) p-value (0.361), same frequency among employed and satisfied 58 (71.6%), housewife and moderately satisfied 58 (43.9%) p-value (0.216), illiterate and moderately satisfied 56 (58.3%) p-value (<0.001), inside city center and satisfied 150 (63.6%) p-value (0.019), moderate income and satisfied 157 (59.5%) p-value (0.298).

Table 7: Association between socio-demographic characteristics with treatment satisfaction scores.

Variables		Treatment satisfaction			P-Value
		Dissatisfied (%)	Moderately satisfied (%)	Satisfied (%)	
Age in year	≤50	5 (100%)	33 (28.4%)	70 (42.1%)	0.01
	>50	0 (0.0%)	83 (71.6%)	103 (57.9%)	
Gender	Female	1 (0.6%)	64 (40.8%)	92 (58.6%)	0.287
	Male	4 (2.8%)	52 (36.6%)	86 (60.6%)	
Marital Status	Married	5 (1.7%)	110(38.1%)	174(60.2%)	0.361
	Widow	0 (0.0%)	6 (60.0%)	4 (40.0%)	
Occupation	Employed	2 (2.5%)	21 (25.9%)	58 (71.6%)	0.216
	Free work	2 (3.1%)	27 (41.5%)	36 (55.4%)	
	Student	0 (0.0%)	0 (0.0%)	1 (100.0%)	
	Housewife	1 (0.8%)	58 (43.9%)	73 (55.3%)	
	Retired	0 (0.0%)	10 (50.0%)	10 (50.0%)	
Educational level	Illiterate	0 (0.0%)	56 (58.3%)	40 (41.7%)	<0.001
	Read and write	1 (5.3%)	5 (26.3%)	13 (68.4%)	
	Primary	3 (3.8%)	31 (38.8%)	46 (57.5%)	
	Secondary	1 (1.8%)	19 (34.5%)	35 (63.6%)	
	Institute & University	0 (0.0%)	5 (21.6%)	44 (78.4%)	
Residency	Inside city center	3 (1.3%)	83 (35.2%)	150(63.6%)	0.019
	Outside city center	2 (3.2%)	33 (52.4%)	28 (44.4%)	
Socio-economic level	Low	1 (4.3%)	11 (47.8%)	11 (47.8%)	0.298
	Moderate	4 (1.5%)	103(39.0%)	157(59.5%)	
	High	0 (0.0%)	2 (16.7%)	10 (83.3%)	

Dicussion

The present cross-sectional study identified lifestyle and satisfaction with treatment in patients with type 2 DM in the Sulaimani city. About (52.3%) of the participants were females, which was disagree with a study conducted in Turkey[20] Regarding marital status, (96.7%) of the participants were married, which was agreed with a study, conducted in Turkey[20] while disagreed with a study done in Lebanon[21] Regarding occupation, most of the participants were housewives (44%), while in the study of Turkey[20] most of the participants were workers and in a study in Iran[22] most of them among retirees. For the residency; most of the participants live inside city center (78.7%) This indicates that the prevalence of DM may also be related to urbanization in Sulaimani. These findings are consistent with studies done in Jordan[23] in Iran[22], in United Arab Emirates[24]. in India[25], and in Palestine[26]. A possible explanation for the higher prevalence of DM in urban could be due to the increasing cardiovascular risk factors in the urban area, due to the changes caused by increased fat and caloric intake and decreased activity, with a sharp rise in a sedentary lifestyle, such as increased usage of televisions and computers, car ownership, an increase in the consumption of a high fat caloric-dense food and refined sugar. Furthermore, the increase in the population growth rates caused some social difficulties, such as unemployment, that resulted in a migration from rural to municipal regions. About the economic status, most of the participants were among moderate economic status (88.3%), which is agreed with a study conducted in Turkey[20] in that study (82%) of the participants had moderate economic status. And disagreed with study of Iran[22] in which most of them were among low economic status. Most of the participants (32%) were illiterates and illiteracy has an association with DM in this study, which is consistent with studies done in Jordan[23], and in Iran[22]. Regarding smoking habit, most of the participants were not smokers (70.7%), this disagreed with many studies conducted in Brazil[27], in Switzerland[28] and in USA[29] About duration of diabetes in years, those who had diabetes mellitus for about 1-5 year accounts (39%) of the participants, which was not consistent with a study done in Turkey[20.]About (66%) of the participants had family history of diabetes. this agreed with studies done in USA[30]. This raises the importance of environmental intervention in the prevention of diabetes in high-risk group, For insulin use in the treatment of type 2 diabetes, only (18.7%) of the participants use insulin, which was not consistent with a study done in Turkey[20] While for the BMI of the participants, (52.3%) of them among overweight, these findings are consistent with studies in Iran[22], and in Turkey[31] .Regarding co-morbidities, (85.7%) of the participants had co-morbidities in general , among which hypercholesterolemia was the most common co-morbid diseases (78.3%),while in the study done inTurkey[20] only (53%) of the participants had co-morbidities in general and hypertension was the most common co-morbid diseases (53.3%). Regarding meat eating habits of the participants, (80.7%) of participants eats meat,

among them (40%) eats meat once weekly, The relationship between red meat intake similar finding found in study done in Japan[32] & in USA[33] .About eating vegetables, (73.7%) of the participants eats vegetables daily, (47%) of them eats 1-2 fruits per day. Regarding exercise habit, (80.3%) of the participants did not do exercise, these findings were in contrast with studies done in Finland[34] and in Brazil[35].Regarding continuation of the same treatment (34.7%) of the participants highly satisfied to continue the same type of the treatment which is not consistent with the study done in USA[36] in that study (96%) of the participants said they would like to continue same treatment. Being unemployed was associated with significantly lower score levels in each dimension of treatment satisfaction scores, a result of study done in Italy[37], while in our study (55.3%) of study participants were housewives and highly satisfied with the treatment.

Conclusions

Most of the participants eat meat once weekly, poultry 4-6 per week, fish once weekly, vegetables daily, fruits 1-2 per day, use salt in food, not doing exercise. Generally most of them satisfied with the treatment highly satisfied with current treatment and continue with it. Dissatisfied with unacceptably high or low blood sugar, moderately convenient with recent treatment and moderately satisfied with their understanding of diabetes mellitus. There was association between socio-demographic characteristics (age, education level and residency) with the treatment satisfaction scores.

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Efficacy of minimally invasive surgery Tension Free Trans-Obturator Tape in management of women with stress urinary incontinence at Maternity Teaching Hospital, Erbil city

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Abstract

Background and Objectives :Stress urinary incontinence (SUI) is consider the most common type of urinary incontinence in female; and is associated with high impact on patient 's hygienic, emotional and social life. This study was conducted to determine the effectiveness of tension free sub-urethral sling procedure(TOT) in the treatment of women SUI and any intra-operative and/or post-operative complication.

Patient and method:A prospective observational study was done in gynaecological out-patient clinic and operative theater of Maternity Teaching Hospital in Erbil city, Kurdistan region, Iraq, from 1st of February 2016 to 1st of February 2017 on 30 women with pure or mixed SUI. Follow-up done up to six weeks postoperative. Preoperative and postoperative assessment of severity of incontinence and its impact on Quality of Life (QoL) done by using specific questionnaire. Data were analyzed using Statistical Package for Social Sciences (SPSS, version 19)

Results: Majority of women (76.7%) were cured after the operation and the rest (23.3) were improved. The mean operation time was 14.03 + 2.025 minutes, ranging from 11 to 18 minutes. The mean blood loss during the operation was 67.47 + 20.163 ml, ranging from 40 to 115 ml .The QoL score after the operation (0.286) was significantly less than the pre-operative score (69.2) ($p < 0.001$).(

Conclusion: TOT procedure is an effective, safe and simple surgical treatment of female SUI with high success rate and low risks and complications.

Key words: Stress incontinence, Sub urethral sling, Quality of life, Urinary incontinence, Vaginal erosion

Introduction:

Urinary incontinence (UI) is a common symptom experienced by significant numbers of adult women. Stress urinary incontinence (SUI) is the most frequently encountered type and affects around 50% of incontinent females. (1) SUI is defined by the International Continence Society as a leak or loss of urine caused by sneezing, coughing, exercising, lifting or physical activity (2).

UI is a distressing and common problem, which may have a high impact on patient's quality of life. as it may cause depression, anxiety, work impairment, and social isolation. (3,4) coital incontinence affects more than one-third of all female urinary incontinent female (UI) women, and can contribute to incontinence-related sexual dysfunction. (5-7)

Female UI is often remains undetected and undertreated, (8,9) because women may refuse to initiate discussions about their urinary symptoms and urinary incontinence due to embarrassment, fear of surgery, and/or lack of knowledge about treatment options (10).

Management options for SUI include conservative and surgical treatments. Midurethral slings are a relatively new treatment option, but have become the procedure of choice for many women. The first midurethral sling was placed by passing trocars with mesh through the retropubic space (Transvaginal tape(TVT) (11). Trans obturator tape (TOT) slings were introduced in 2001 with the goal of avoiding some of the complications of retropubic insertion (eg, bladder perforation, vascular injury, bowel injury). Trans obturator slings are placed by passing trocars with mesh through obturator canal and avoiding the retro pubic space completely. The TOT would theoretically have the same anti-incontinence outcomes as the TVT. Significant complications are rare with this type of surgery. However, there is no surgery without risk and complications. (12) The most important benefits of the TOT as compared with other sling procedures is the less incidence of *de novo* urge/urge incontinence(13).There is no more change in patient's sexual life as regards pleasure and frequency of intercourse and/or pain during penetration, whereas there is a significant decrease in coital incontinence(14).

According to the best knowledge of the researchers this is the first time to conduct this operation using out in suburithral tape for women with stress incontinence in Maternity Teaching Hospital, Erbil city to determine its efficacy and complications related to its use.

Aims of study

The primary goal of the study was

with the secondary goal of assessing the

safety and efficacy of the TOAllow-up of six weeks .

1) To determine the effectiveness and success rate of Tension Free Trans- Obturator vaginal Tape (TOT) procedure in the treatment of women with stress urinary incontinence

2) To detect any intra-operative and/or post-operative complications and to assess the quality of life of the patients before and after the procedure

Patients and Methods

The protocol and the study design were approved by the scientific council of Obstetrics and Gynecology / Iraqi Board for Medical Specialization. A prospective observational study was conducted on 30 women presented with urinary incontinence to gynecology outpatient clinic in Maternity Teaching Hospital, Erbil city, Kurdistan region, Iraq from February 2016 to December 2016. Formal verbal consent was taken from all women participated in this study, TOT procedure performed under general or spinal anesthesia to all of them

The study included women with SUI or mixed UI of any age group, having no contraindications for anesthesia, women having cystocele were classified according to the Baden and Walker classification in to grade 1, 2 and 3 (15) and accepted to participate in the trial

Patients were excluded if they had a small bladder capacity (<300 mL) or, had any neurological pathology affecting the bladder, on antipsychotic treatment, having history of radio- or chemotherapy, having any serious medical condition like complicated diabetes mellitus, bronchial asthma, ischemic heart disease, having active urinary or vaginal infections, women who have previous surgery for stress urinary incontinence and if the patient refused to participate in the research.

Stress urinary incontinence defined as involuntary loss of urine on coughing, laughing, sneezing, climbing stairs, or other physical activities. Urge urinary incontinence of involuntary loss of urine accompanied by or immediately proceeded by urgency. Mixed urinary incontinence is the complaint of involuntary loss of urine associated with urgency and also during exertion, sneezing and any increased intrabdominal pressure causes (2).

The preoperative evaluation of the women included a detailed medical history, general, focused neurological examination, and detailed pelvic examinations .Vaginal examination done when the bladder was full and empty to assess the presence of pelvic organ prolapse and determine their degree.

Bladder stress test was done when the bladder being comfortably full the patient was checked for incontinence when the patient in lying in dorsal position and repeated with the patient standing by asking to cough and confirming the presence of incontinence by visualization of urine coming out the urethra during staining (16).

Each patient was investigated by mid-stream urine analysis and if infection was there then culture and sensitivity was requested for them

Abdomino-pelvic ultrasonography was used in all patients to evaluate the kidneys and bladder, and to exclude the presence of a significant PVR by repeating the ultrasound after asking the patients to empty the bladder and the ultrasound was repeated.

The severity of urinary incontinence was classified according to the Stamey incontinence score; to grade 1,2,and 3 (17) . The assessment done twice before and after TOT procedure.

Anterior colporrhaphy done for cases with grade 2 and 3 cystocele; after taking formal agreement, before application of the TOT procedure.

Affection of involuntary urine loss on the quality of life (activities, relationships, feelings and emotional health) was assessed using Incontinence Impact Questionnaire-Short Form IIQ-7 (18).

The body mass indexes (BMI) were: Underweight<18.5 kg/m2, normal weight 18.5-24.9 kg/m2, overweight 25-29. 9 kg/m2 and obese as ≥30 kg/m2 (19).

All participant were treated using TOT outside-in sling (Monarc), AMS company, Minnetonka, USA.

The patient were operated on under anesthesia and placed in the exaggerated lithotomy position, urine was evacuated using Foley catheter (18-F). A small midline vaginal incision was made 1cm below the external urethral meatus and the para-urethr space were opened .Bilateral skin punctures were made in the genitofemoral fold at the level of the clitoris. The tape was then applied using 'out-in' technique vaginal incision was closed using 3–0 vicryl sutures

The time taken for the surgical procedure was recorded for every patient in minutes starting from skin incision to closure of it (the time needed for anterior colporraphy was not recorded). The amount of blood loss at the surgery was assessed by using pre-weighed pack and calculating their difference in weight before and after surgery.

Intra-operative complications as: (vaginal wall injury, bleeding, bladder or urethral perforation) and early post-operative complications (thigh pain, short term voiding difficulty, hematoma, dysuria, or infection) and late post-operative complication (perineal pain, dyspareunia, and de novo urge incontinence) were recorded .

Postoperative analgesia and pain killers were used. Twenty four hours after the surgery patients were discharged home after conferring that they have passed urine freely

All patients were given an advice at the time of discharge to use chair-style toilet seat only and avoid squat position and preventing intercourse and lifting heavy things for 4 weeks. They were also advised on an adequate fluid intake so as to avoid urinary tract infections and also avoid constipation.

Evaluation of women done by direct interview and physical examinations 1 week and 6 weeks after surgery. At the follow-up visits, they were asked about, any pain or other complain, and their satisfaction with the surgical result. Surgical outcome was evaluated by the bladder stress test and symptoms of incontinence. The patients were regarded cured of SUI if they had a negative bladder stress test and there were no reports of urine leakage during stress (objective and subjective cure). Patient's improvement was considered when she had no leakage of urine on the cough test ; but may have had some occasional leakage of urine during stress

Data were analyzed using the Statistical Package for Social Sciences (SPSS, version 19). Means were calculated for numerical variables, and proportions were calculated for categorical variables. Wilcoxon ranked-sign test was used to compare the mean ranks of quality of life before and after the operation. A p value of ≤ 0.05 was considered statistically significant.

Results: Thirty women participated in the study. Their mean age was 54.9 $\pm$ 6.7 years, ranging from 44 to 66 years. The median was 54 years. Only 26.7% aged less than 50 years. The majority (76.7%)

had five or more children. None of the women had normal weight, only 26.7% were over-weight, and the rest were obese. The majority of the women (93.3%) had history of vaginal deliveries, and the rest had history of both vaginal and abdominal deliveries (delivery by cesarean section), i.e. all of them had history of vaginal deliveries, as mentioned in Table 3.1. The same table shows that two thirds of the sample was menopausal women, and 83.3% were sexually active. Results showed also that none of the women were on hormonal replacement therapy.

Table 1. Basic characteristics of the studied sample.

Variables	Categories	No.(%)	Mean ±SD
Age (years)	< 50	8(26.7)	54.9±6.7
	50-59	12(40)	
	≥ 60	10(33.3)	
Parity	< 5	7(23.3)	5.7±1.7
	≥ 5	23(76.7)	
BMI	27-29	8(26.70)	32.4±3.2
	30-34	16(53.3)	
	≥ 35	6(20.0)	
MOD	Vaginal	28(93.3)	
	VD and c/s	2(6.7)	
Menopause	No	10(33.3)	
	Yes	20(66.7)	
Sexual activity	No	5(16.7)	
	Yes	25(83.3)	

BMI: Body mass index, Mod : Mode of delivery

The majority of patients (86.7%) got pure stress incontinence, and only 13.3% had mixed type. Examination showed that 70% had cystocele, and none of them had vault prolapse. Only two patients had history of operations, which were for vaginal repair (Table 2). Patients with cystocele were classified into grade 1 (9 patients), grade 2 (9 patients), and grade 3 (3 patients).

Table 2. Distribution of patients by type of stress incontinence, presence of cystocele, vault prolapse, and history of operations.

Variables	Categories	No.(%)
Type of stress incontinence	Pure	26(86.7)
	Mixed	4(13.3)
Cystocele	No	9(30)
	Yes	21(70)
Vault prolapse	No	30(10)
	Yes	0(0)
Previous operation	No	28(93.3)
	Yes	2(6.7)

Table 3 shows very clear improvement in the quality of life of patients after the operation. The table shows down grading in the impact on quality of life of all the seven indicators, as in general the activities of the majority of patients returned back to normal after the operation.

Table 3 : Shows the Impact of the stress incontinence on the indicators of the quality of life, before and after the TOT operation.

		Pre-op. impact		**Post-operative impact**					
	severity			**Not at all**		**Slightly**		**Total**	
Indicators		**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Ability to do household chores	Slightly	10	33.3	10	100	0	0	10	100
	Moderately	19	63.3	19	100	0	0	19	100
	Greatly	1	3.3	1	100	0	0	1	100
Physical recreation	Moderately	14	46.7	14	100	0	0	14	100
	Greatly	16	53.3	10	62.5	6	37.5	16	100
Entertainment	Moderately	24	80.0	23	95.8	1	4.2	24	100

activities	Greatly	6	20.0	4	66.7	2	33.3	6	100
Ability to travel more than 30 minutes	Slightly	3	10.0	3	100	0	0	3	100
	Moderately	17	56.7	17	100	0	0	17	100
	Greatly	10	33.3	8	80	2	20	10	100
Participation in social activities outside home	Slightly	1	3.3	1	100	0	0	1	100
	Moderately	18	60.0	16	88.9	2	11.1	18	100
	Greatly	11	36.7	6	54.5	5	45.5	11	100
Emotional health (nervousness & depression)	Slightly	8	26.7	8	100	0	0	8	100
	Moderately	17	56.7	17	100	0	0	17	100
	Greatly	5	16.7	5	100	0	0	5	100
Feeling frustrated	Slightly	12	40.0	12	100	0	0	12	100
	Moderately	17	56.7	17	100	0	0	17	100
	Greatly	1	3.3	1	100	0	0	1	100

Table 4 shows that the majority (76.7%) of patients cured after the operation and the rest were improved. The intra-operative complications reported in only one patient (3.3%) who developed vaginal wall injury. In day one post-operatively, 16.7% developed thigh pain, and 3.3% developed short term voiding difficulty. All the complications disappeared on week 6 post operatively. None of the patients needed blood during the operation.

Table 4. Operation success and complications.

Variables	**Categories**	**No.**	**%**
Success of operation	Improved	7	23.3
	Cured	23	76.7
Intra-operative complications	No	29	96.7
	Yes	1	3.3
Day 1 complications	None	24	80.0
	Thigh pain	5	16.7
	Short term voiding difficulty	1	3.3
Week 1 complications	None	28	93.3

	Thigh pain	1	3.3
	Infection	1	3.3
Week 6 complications	None	30	100.0
Intra-operative need for blood	None	30	100.0
Total		30	100

The mean (± SD) of operation time was 14.03 ± 2.025 minutes, ranging from 11 to 18 minutes. The mean (± SD) of blood loss was 67.47 ± 20.163 ml, ranging from 40 to 115 ml (Table 5).

Table 5. Details of operation time and blood loss.

	Mean	**SD**	**Minimum**	**Maximum**	**Median**
Operation time (minutes)	14.03	2.02	11	18	14.0
Blood loss (ml)	67.47	20.16	40	115	64.5

The severity of SI was much improved post-operatively, where all the 18 patients of grade 2 pre-operatively, converted to grade 0 after the operation. Five patients (41.7%) of the grade 3 converted to grade 0 after the operation (Figur 1).

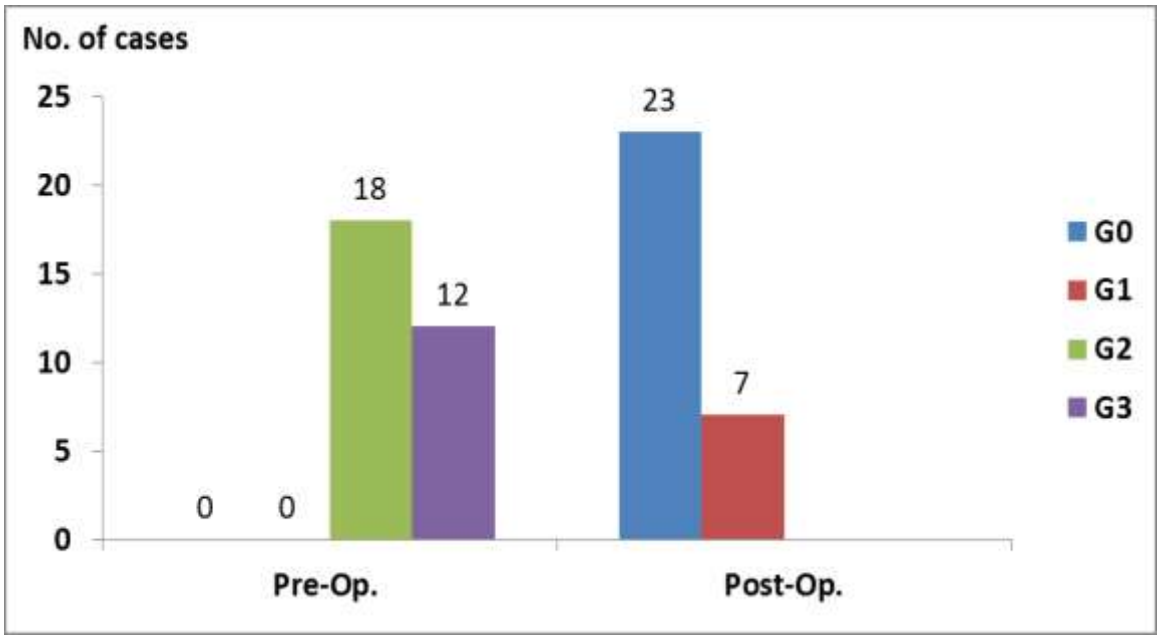

Figure 1: shows the comparison between pre and post-operative severity of SUI.

The QoL score significantly improved after the operation. The score after the operation (0.286) was significantly less than the pre-operative score (69.2) ($p < 0.001$) as shown in table3.7.

Table 6. Pre and post-operative scores of quality of life (QoL)

Pre-operative score (100)		**Post-operative score (100)**		
Mean	**SD**	**Mean**	**SD**	P*
69.206	11.780	.286	.539	< 0.001

*By Wilcoxon Signed Ranks Test.

Discussion

The results of a recent large multicenter trial have confirmed excellent outcomes and a low rate of complications to be expected after treatment with MUS (20).

In current study; the majority of patients operated on for stress urinary incontinence (pure and mixed UI) were 54.9 + 6.7 years, only 26.7% aged less than 50 years. Published articles on the mean age of women with SUI and operated on were all around this age group (21, 22). The majority of participants were grand multipara and the vaginal delivery was the predominant mode of delivery. All the women in current study were either obese or over weight. Ghanbari et al conducted a study on women also operated on for SI where the mean parity was also 5 ± 0.66, and the BMI was 28 + 1.5. (23). Two thirds of the women included in this study were menopausal women with none of them on HRT, and the majority was sexually active. In Al alaf study where TVT-O procedure (inside-out) was conducted to determine the effectiveness of a sling procedures in treating female SUI; 50% of patients were menopause, and 83% were sexually active. (24).

There was a very clear improvement in the quality of life of patients after the operation in this study; as in general the activities of the majority of patients returned back to normal after the operation. This was in accordance to researched done by Taweel et al and Moore et al (21, 22)

Mean operative time for conduction the suburethral tape insertion in published articles is different from12 to 25 minutes (22, 25)

Magon N et al reported a mean intra-operative blood loss of 76.78 ± ml (26) while the mean blood loss was reported by Taweel et al to be 57±22ml (21)

The mean blood loss in the current study was 67.47±20.16 ml.

The intra-operative complications reported in only one woman who developed vaginal wall injury, (which was identified at the time of insertion of TOT needle in the surgery, the needle removed immediately and then reinserted without any complications). Unrecognized, vaginal wall injury may cause mesh extrusion for that reason, it is important to check the lateral vaginal wall after passing the tunneler through transobturator foramen. All studies and researches that reviewed TOT alone or with comparison with the TVT mid-urethral sling procedures demonstrated vaginal wall injury and/or mesh extrusion during or after TOT insertion .(27-29)

There was no any case of bladder injury in current study for that reason intraoperative cystoscopical examination was not performed. Several cases of bladder injury were reported by Sivanesan and colleagues, (30) Abdel-Fattah and colleagues after performing 390 cases of TOT by different routes, found that the lower urinary tract injury may occur with the outside-in technique. (3 1)As they reported that; women who underwent concomitant vaginal surgeries, were on risks of bladder injuries; while women underwent secondary procedures were at risk of urethral injuries. They recommend performance of cystoscopy in all cases that associated with pelvic surgery, previous retro pubic surgery, presence of prolapse, or in cases where there is difficulty in the insertion of the tapes. (30, 31)

In day 1, 16.7% developed thigh pain which was managed effectively by simple analgesia, and 3.3% developed short term voiding difficulty that was improved after catheterization for 24 hours.

The majority of women cured after the operation and the rest were improved. These results similar to a study reported by Waltergny and colleagues where the outcomes with a minimum of 3 years follow-up were (88.4%) of patients were cured and (9.3%)were improved.(32)(

The QoL score was greatly improved after the TOT procedure. Post-operative score was (0.286), which was significantly less than the pre-operative score (69.2) , There was a more statistically difference between incontinence severity scores and QoL scores of women before and after the TOT surgical technique , these results were similar to a study performed by David W, et al, whom assess the safety and efficacy of TOT technique for women with SUI and reported a significant decrease in continence severity and improvement in quality of life among women included in that study(33)

One of the limitations of this study was that the urodynamic test was not used being not available in the hospital and other governmental hospitals in Erbil city; also the specificity, sensitivity and predictive value for diagnosis and predicting outcome in women with urinary incontinence has not

been analyzed. Although more than 2 third of participant were totally cured and 23. % was improved. The time period for following the patients post-operatively was up to six weeks; so evaluation of long-term morbidity and / or long-term patient satisfactory was limited.

In post-operative period; the majority of patients(86.7%) assessed directly by physical examination in gynecological out-patient clinic ;and this regarded as a power for the study while the remainder (13.3%) of patients assessed indirectly by calling them and history taking rather than direct physical examination being either far away from the hospital or due to some social reasons that limit their attendance for the hospital .

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Comparative Study of Mathieu and Snodgrass Repair for Anterior Hypospadias

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Abstract

Objective: to compare the outcome of Mathieu flap and Snodgrass repair in the treatment of anterior hypospadias.

Material and methods: Since November 2006 to April 2009 number of 50 patients suffering from anterior hypospadias (coronal, subcoronal, and distal shaft) underwent Mathieu flap repair (25 patients) and (25patients underrun Snodgrass repair.

All cases operated as a day case surgery, all the cases were stented for one weak, then followed up for one month and the complications compared between the two groups.

Results: Wound break down and urethral stricture was seen in 2 (8%) and 2 (8%) respectively in both groups while the incidence of urethro-cutaneous fistula is lower in Snodgrass group 1 (4%) than Mathieu flap group 2 (8%) and the incidence of meatal stenosis is higher in Snodgrass group- 2 (8%) than Mathieu-1(4%) as shown in table(1).stream abnormality was seen only in cases with meatal stenosis and improved with dilatation of the meatus and or meatotomy.

Cosmetic results were excellent with Snodgrass repair with a normal looking slit like meatus.

Conclusion: both methods of hypospadias repair are good and reliable with overall good result but the Snodgrass repair found to have better results regarding the overall success rate and better cosmetic appearance because it produce normal looking vertical slit urethral orifice while in Mathieu flap it looks transverse (fish mouth).

Key words: Anterior hypospadias, Mathieu flap, Snodgrass, tabularized incised plate, urethrocutaneous fistula.

Introduction:

Hypospadias is a congenital abnormality caused by incomplete development of the anterior urethra, in which the urethral meatus opened on the ventral side of the penis instead of the apex of the glans. its incidence rate is reported to be about 1 in 300 male live birth[1]. Hypospadias is divided in to three types according to the site of orifice, posterior, middle, and anterior. In anterior type, the meatal orifice open either on the distal penile shaft, on corona, or under the glans [2].

The most common type of hypospadias is anterior type (80%).

The aim of surgery in hypospadias is to achieve a functional penis with a normal cosmetic appearance. The commonest repairs to correct distal hypospadias are the Thiersch-duplay[3],Mathieu mastarde[4], meatal advancement, glanduloplasty(MGPI) and tabularized incised plate(TIP) [5,6].

Of these procedures Mathieu and TIP have been widely practiced, Snodgrass is now the preferred method since it create a vertical slit-like normal appearing meatus unlike a horizontally oriented and rounded (fish mouth) produced by the meatal based flap(Mathieu).

TIP allows the construction of new- urethra from the existing urethral plate without additional skin flaps and this technique is suitable for all distal lesions.

Both methods make use of the urethral plate which makes the appearance of near natural [6]

In this study we compare the rate of complication in general and the difference in the percentage of each complication in these two methods.

Methods and Materials

A total of 50 patients were studied, Mathieu repair was done in 25 patients and Snodgrass repair is performed in 25 patients. All patients were operated under general anesthesia. A tourniquet was applied to maintain a bloodless field. A straight penis was confirmed by performing artificial erection.

For Mathieu flip flap repair a parameatal based flap was raised with an intact blood supply and is anastomosed to the urethral plate after mobilizing the latter with two parallel incisions and the repair performed in three layers with polyglycolic acid(6\0) interrupted sutures with the knots to the inside the urethral lumen as shown in figure (1) .

For Snodgrass repair a U-shaped incision was made extending along the edges of the urethral plate to healthy skin 2mm proximal to the meatus, flaps mobilized for a tension free repair.

The urethral plate is then incised in the midline from the hypospadiac meatus distally. The incised plate was then tabularized over a (6-8)F stent using interrupted polyglycolic acid (6\0) sutures. Neourethra was then covered with a vascularized dartos flap harvested from subcutaneous tissue of dorsal prepucel skin as shown in figure (2).

All case was operated as day case surgery without hospital admission.

All cases received antibiotics prophylactically.

Stents was removed after 7-10days.

All patients were follow-upped for 3 months.

All cases were circumcised and the dorsal hood used to cover the neourethra.

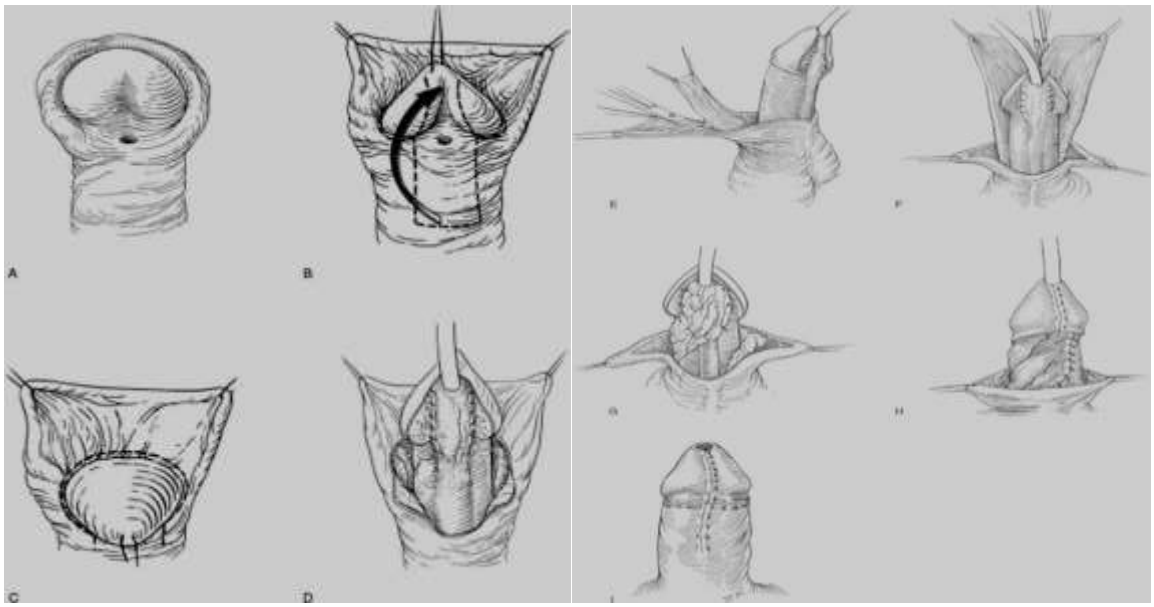
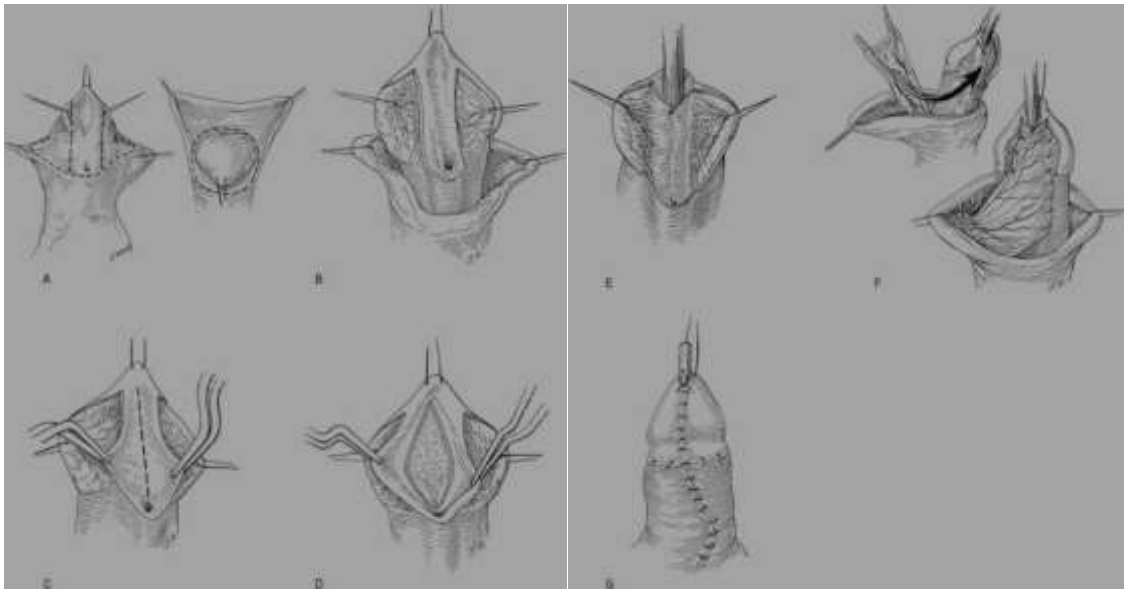


Figure (1) Matheu flap procedure



Figure(2) TIP (Snodgrass) urethroplasty

Results

Total of (50) cases were studied. Group 1 (n=25) underwent Mathieu repair and group 2 (n=25) had Snodgrass repair. Age ranged between 3 and 13 years with mean of 5 years coronal hypospadias was present in 25 (50%) and distal penile in 25 (50%) .

Urethral plate was healthy in all .presurgical hormonal treatment was not given to any patient. Operative time ranged from 50 to 90 minutes (mean=65min). all cases was done as a day case surgery without hospital admission.

Wound break down and urethral stricture was seen in 2 (8%) and 2 (8%) respectively in both groups while the incidence of urethro-cutaneous fistula is lower in Snodgrass group 1 (4%) than Mathieu flap group 2 (8%) and the incidence of meatal stenosis is higher in Snodgrass group 2 (8%) than Mathieu 1(4%)as shown in table(1).stream abnormality was seen only in cases with meatal stenosis and improved with dilatation of the meatus or meatotomy.

Cosmetic results were excellent with Snodgrass repair with a normal looking slit like meatus

Table (1): Complications in two groups

complications	***Group 1:*** ***Mathieu***	***Group 2:*** ***snodgrass***
Wound breakdown	2(8%)	2(8%)
fistula	2(8%)	1(4%)
Meatal stenosis	1(4%)	2(8%)
stricture	1(4%)	1(4%)

Discussion

Hypospadias is a common clinical problem with an incidence rate of 1in 300 live male births [8]

In the majority of case the abnormal meatus is situated in the glans. coronal or in the distal part of the shaft. The goal of the repair is to perform functionally and cosmetically normal penis. More than 200 methods of repair have been introduced throughout the 125 years history of hypospadias repair. In earlier most of the distal lesion were repaired with meatal-based flap procedure, although this repair produced a glanular meatus, the opening was often rounded, in contrast to a slit like appearance of normal meatus.

This technique was first described by Mathieu in 1932 for distal hypospadias using a meatal based flap [9], then in 1981 Wacksman reported his initial experience with this technique.[12] subsequently in 1987, Rabinowitz described catheter-less repair using the Mathieu flap repair.[10] although 1 and 2-layer neouretral anastomoses have demonstrated satisfactory results, the 2-layer technique has produced lower complications.[11]

Careful preservation of the vasculature and avoidance of overlapping suture lines produce a water-tight closure with minimal risk of postoperative fistula formation.

Mathieu repair also provide good functional results but cosmetics is more preserved in Snodgrass repair. Even now Mathieu repair is considered as the standard by some surgeons, for distal hypospadias. [2,11,12]

Rich et al incised the urethral plate in the midline to improve the cosmetics of repair at 1989. [13]

Latter in 1994, Snodgrass advanced this concept by extending the incision of the urethral plate from the meatus to the tip of the glans. [4]

This procedure allowed construction of the new urethra from the existing urethral plate. It was suggested that healing may occur through epithelialization of the relaxing incision without obvious scarring, allowing the incised edges to remain separated. [14]

At the time being the (TIP) urethroplasty has become a preferred method for repairing distal hypospadias because of its versatility, to correct different meatal variants, the simplicity of the operative technique, low complication rate and reliable creation of the normal looking meatus. [15].

Conclusion

Both methods of hypospadias repair are good and reliable with overall good results but the Snodgrass repair found to have better results regarding the overall success rate and better cosmetic appearance because it produce normal looking vertical slit urethral orifice while in Mathieu flap it produce transverse (fish mouth) and the results of this surgery become better with experience.

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Antimicrobial susceptibility of extensively drug-resistant (XDR) and multidrug-resistant (MDR) *Pseudomonas aeruginosa* isolated from patients in Erbil city

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Abstract

Background and Objectives: Bacterial infections including antibiotic resistant Gram negative non lactose fermenter such as *Pseudomonas aeruginosa* has emerged as major threats to human. Isolates show extreme or complete resistant to all except one or two classes of potentially effective antibiotics were considered as extensively drug-resistant (XDR) and those that were resistant to at least three classes of effective antibiotics recommended for treatment were referred as MDR. The purpose of the current study was to determine the occurrence of extensive drug resistance and pandrug resistant in isolates of *P. aeruginosa.*

Materials and Methods: During a one-year period, 91 *P. aeruginosa* were isolated from various clinical samples from infected patients in hospitals. Antimicrobial susceptibility testing was performed on all isolates by Vitek II to identify extensive drug resistance.

Results: Out of 91 isolates of *P. aeruginosa* studied 71 (78%) were found to be XDR and 56 isolates (61.5%) were MDR. of which 36 isolates exhibited resistance to all groups of antimicrobials except one group, rest 20 isolates exhibited resistance to all groups except two groups. However, XDR producing isolates showed 100% resistance against cefoxitin cefuroxime, cefotaxime, Trimethoprim/ Sulfamethoxazole and ampicillin. The resistance rate towards cefepime, imipenem, tobramycin and ciprofloxacin was 78.8%, 67.6%, 81.6%, and 66.1%, respectively, and all isolates were susceptible to colistin. Thus, colistin appeared to be most effective antimicrobial agent against *P. aeruginosa*. The findings of the current study reveal increased burden of XDR and PDR *P. aeruginosa* in our situation.

Conclusion: The majority *P. aeruginosa* isolates were found to be resistant to commonly available antimicrobial agents. Therefore, surveillance and proper antibiotic administration based on culture and sensitivity are all essential for preventing incidence of MDR and XDR *P. aeruginosa*

Keywords: Antimicrobial susceptibility**;** Extensive drug resistance**;** Pandrug resistance; *P. aeruginosa*, Multi-drug resistant

Introduction:

P. aeruginosa is a major opportunistic human pathogen associated broad spectrum of infections mainly bacteremia, wound burn, urinary tract infections, pneumonia and cystic fibrosis particularly in immunocompromised, debilitated, hospitalized patients and those in the intensive care units (ICUs) that contributing to greater morbidity and mortality rates [1]. The anti-Pseudomonal anti-microbial classes with activity against *P. aeruginosa* strains are penicillins /cephalosporins, monobactams, quinolones, aminoglycoside and carbapenems [2]. However, some strains of *P. aeruginosa* have been found resistant to most previously prescribed antibiotics [3]. The rapid and irrepressible increase use in antimicrobial chemotherapy of pathogenic bacteria is widely accepted as a major problem in hospitals followed by the emergence of drug resistance and rapid clonal spread which is becoming a challenging problem worldwide over the past several decades [4,5]. These capabilities have allowed MDR pathogens to be abundant in the hospital environment as well as the community and have made it one of the frontline pathogens threatening the existing antibiotic era [6]. The mechanism and spread of resistance is a complex process that is acquired either through mutations or via horizontal transfer of mobile DNA elements [7]. Antibiotic resistance is a particular problem in *P. aeruginosa* that can be the result of the production of enzymes such as beta-lactamase, alterations in Penicillin- binding proteins, decreased expression of porins, overexpression of efflux Pumps, that makes *P. aeruginosa* a pathogen with a high propensity to becoming resistant to antibiotic therapy [8]. Consequently، treatment options are narrowed down to only a few antibiotics [9]. Currently, terms such as extensive drug resistance (XDR), multi-drug resistance (MDR) and pan drug resistance (PDR) are used to describe the depth of resistance [10]. Unfortunately, no comprehensive data about the occurrence of XDR and MDR in Erbil, Kurdistan are available. The aim of the current study was to evaluate the drug resistance profiles among *P. aeruginosa* to different classes of antibiotics as well as detecting the presence of resistance determinants including XDR and MDR *P. aeruginosa* isolates collected from the different clinical specimen in Erbil city.

Materials and Methods:

A total of 91 consecutive, non-duplicate isolates of *P. aeruginosa* recovered from various clinical specimens between December 2014 to May 2015 submitted to three different hospitals in Erbil city. All clinical isolates were reviewed for XDR, MDR and PDR status. Antimicrobial susceptibility testing was done by Vitek II to the following antimicrobial agents ciprofloxacin, cefoxitin, cefepime, cefotaxim, ceftazidime, cefuroxime, gentamycin, imipenem, meropenem, piperacillin tazobactum, tobramycin, norfloxacin , nitrofuranton and colistin as per European Committee on Antimicrobial Susceptibility Testing (EUCAST) MIC breakpoints were used to interpret susceptibility to antimicrobial agents [11]. Isolates were considered as Multi-drug resistant (MDR) when they were non-

susceptible more than 3 potentially effective of commonly used antimicrobials classes (penicillins, cephalosporins, aminoglycosides, quinolones, β lactamase inhibitor combinations and Carbapenems), and extensively drug-resistant (XDR) when they were non-susceptible to all except two or fewer classes antimicrobial categories while PDR" as those resistant to all classes of antimicrobial agents available [12,13].

Results:

During the study period, out of 91 *P. aeruginosa* samples screened, the distribution of samples was as followed: the highest percentage of isolates were from burn,27; followed by urine, 19; pus,16; blood, 10;aspiration,8; sputum, 4; and others,3 (Table. 1). Of these, 91 samples 71 (78%) were confirmed as XDR *P. aeruginosa.*

Table1. Distribution of *P. aeruginosa* isolates divided into clinical specimens.

Specimen type	**Number of Specimens (%)**
Sputum	4(4.4%)
Pus	16(17.6%)
Blood	10(10.9%)
Urine	19(20.9%)
Aspiration	8(8.8%)
CSF	4(4.4%)
Burn	27(29.7%)
Others	3(3.3%)
Total	91

Antimicrobial susceptibility pattern and details of the antimicrobial agents used against the entire MDR and XDR *P. aeruginosa* isolates and its resistance profile toward all the antibiotics are shown in Table 2. Then the highest resistance attributing pathogenic *P. aeruginosa* showed 100% resistance toward ampicillin, cefuroxime, cefoxitin cefotaxime, trimethoprim/sulfamethoxazole then, tobramycin, ceftazidime, cefepime imipenem and meropenem 64.8%, 65.9%, 61.5%,59.3%, 51.6% respectively. Meanwhile, all isolates of *P. aeruginosa* were susceptible only to colistin.

Table 2. Antimicrobial resistance profile of 91 *P. aeruginosa* isolates.

Antibiotic	Susceptible *n* (%)	Intermediate *n* (%)	Resistant *n* (%)
Ampicillin	0(0%)	0(0%)	91 (100%)
Piperacillin/Tazobactam	1(1.09%)	30(32.9%)	60 (65.9%)
Cefuroxime	0	0	91 (100%)
Cefoxitin	0	0	91 (100%)
Cefotaxime	0	0	91 (100%)
Ceftazidime	27(29.7%)	4(4.3%)	60(65.9%)
Cefepime	27(29.7%)	8(8.7%)	56(61.5%)
Imipenem	24(26.3%)	13(14.2%)	54(59.3%)
Meropenem	34(37.3%)	10(10.9%)	47(51.6%)
Tobramycin	32(35.1%)	0	59(64.8%)
Ciprofloxacin	37(40.6%)	6(6.5%)	48(52.7%)
Gentamicin	19(20.8%)	2(2.1%)	70(76.9%)
Nitrofurantoin	1(1.09%)	0	70(76.9%)
Norfloxacin	39(42.8%)	0	52(57.1%)
Trimethoprim/ Sulfamethoxazole	0	0	91 (100%)
Colistin	91 (100%)	0(0%)	0(0%)

Clinically, XDR *P. aeruginosa* showed 100% resistance toward cephalosporins (cefuroxime, cefoxitin and, cefotaxime), quinolones (ciprofloxacin 47 (66.1%) and Aminoglycosides tobramycin 58 (81.6%) As shown in Table 3, carbapenem (meropenem and imipenem) were used as a last resort of antimicrobial agents found to be resistant against XDR producing isolates, with efficacy rate reached 67.6% and 61.9%, respectively Meanwhile, colistin was best sensitive drug against XDR producing *P. aeruginosa* with efficacy rate that reached 100%.

Table 3. Antimicrobial susceptibilities of XDR producing *P. aeruginosa* isolates.

Antibiotic categories	Susceptible *n* (%)	Intermediate *n* (%)	Resistant *n* (%)
Extended-Spectrum Penicillins			
Piperacillin/Tazobactam	1(1.4%)	14(19.7%)	58(81.6%)
Cephalosporins			
Cefuroxime	0(0%)	0(0%)	71 (100%)
Cefoxitin	0(0%)	0(0%)	71 (100%)
Cefotaxime	0(0%)	0(0%)	71 (100%)
Ceftazidime	8(11.2%)	4(5.6%)	58(81.6%)
Cefepime	8(11.2%)	7(9.8%)	56(78.8%)
Carbapenems			
Imipenem	10(14%)	13(18.3%)	48(67.6%)
Meropenem	17(23.9%)	10(14%)	44(61.9%)
Aminoglycosides			
Tobramycin	13(18.3%)	0	58(81.6%)
Quinolones			
Ciprofloxacin	18(25.3%)	6(8.4%)	47(66.1%)

A total number of 91 *P. aeruginosa* isolates 56 (61.5%) isolates were observed to be MDR and 71 (78%) isolates were found to be XDR. All 56(100%) isolates of MDR *P. aeruginosa* were susceptible to colistin (Fig 1).

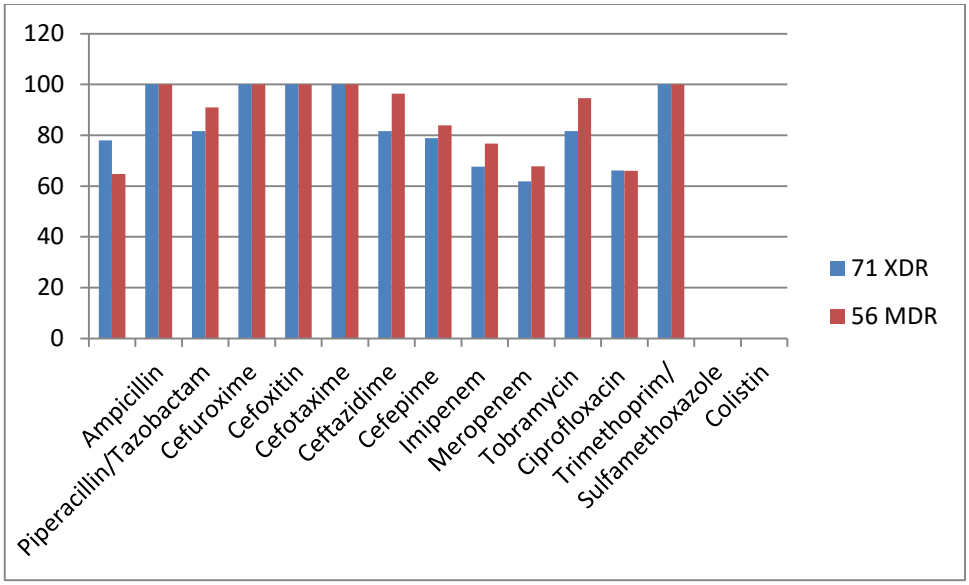

Figure 1: Antimicrobial resistance profile of 71 XDR and 56 MDR strains of *P. aeruginosa*.

Discussion:

The study determined the antimicrobial susceptibility profile and the occurrence of the XDR and MDR –producers among *P. aeruginosa* isolates. In the current study, 27 patients had burn wound infection, 19 had UTI, 16 had pus. 10 patients with bacteremia and 8 *P. aeruginosa* isolates *from* aspiration of patients who had no prior hospitalization. The highest prevalence 27(29.7%) of *P. aeruginosa* infections among burn wound patients could be due to an environmental spread of this organism in the hospitals, besides the fact that burn wounds are a perfect body site for bacterial survival and growth. These are frequently resistant to the most routinely used antimicrobial agents in burn units [14].Antimicrobial resistance among *P. aeruginosa* has increased alarmingly in the past few decades[15]. Definitions of multidrug-resistant *P. aeruginosa* against antimicrobial agents may be illuminated by the organism's relatively impermeable outer membrane, selective pressure, and environmental acquaintance to a large reservoir of resistance genes[16]. Present study followed the most common definition of (MDR) multidrug resistance, extensively drug-resistant (XDR) and pan-drug resistant (PDR) *P. aeruginosa* identified by (ECDC) European Centre for Disease Prevention and Control [17]. Presently, *P. aeruginosa* infections are treated with aminoglycosides, third and fourth generations of cephalosporins, and carbapenems, either alone or in combination and MDR, and extensively resistant *P. aeruginosa* have already emerged [18]. XDR producing isolates are capable of hydrolyzing broad-spectrum cephalosporins and carbapenems [5]. In the present study, 71(78%) of *P. aeruginosa* were XDR producers that exhibited sensitivity to only 1 group or 2 groups of antimicrobial categories. The XDR-producing isolates exhibit resistant to many other classes of frequently used antibiotics resulting in restriction of their therapeutic options[2]. A study in indicated

that previous usage of quinolones was one of the independent risk reasons for the emergence of XDR *P. aeruginosa* infection [12]. No previous study has investigated the prevalence of XDR from patients in Erbil hospitals. The incidence of MDR in *P. aeruginosa* isolates was 61.5% (56 out of 91 isolates) which is comparable to several investigations, particularly from Iran and India who identified 99 strains out of 150 (66%) of isolates as MDR and 73.1% respectively [2,5]. The phenomena of occurrence of MDR in *P. aeruginosa* have also been traced to alteration in the drug target sites, gaining of drug resistance genes, or development of newly acquired mechanisms. Our result is in agreement with the findings of other studies conducted over the world that High level of resistance by *P. aeruginosa* was shown against cephalosporin and medium level against carbapenems which was in harmony with the earlier study that stated 100% of the isolates were resistant to cephalosporin ceftazidime, cefotaxime, cefepime and 45.5% to imipenem [19]. The high level of resistance (>50 %) seen against most tested antimicrobial classes could be due to abuse or misuse of these antibiotics in our country, accessibility of these antibiotics purchase without any prescription. Colistin is the drug of choice and most effective for treatment of patients having severe infections due to XDR [20,21].

Conclusion:

Emergence of MDR and XDR strains of *P. aeruginosa* suggest continuous surveillance and improvement of plans for antimicrobial resistance control in Kurdistan, because surveillance of antibiotic resistance patterns and antibiotic use acts a vital role for giving better information in guiding the clinicians to choose appropriate therapy of infected patients as well as continuous monitoring changes in antimicrobial susceptibility over time is the best preventive and therapeutic strategies.

Conflicts of Interest: The author reports no conflicts of interest.

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Outcome of Corneal Collagen Cross-Linking In Keratoconus Patients In Erbil

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Abstract

Background and objective: Keratoconus is a disease characterized by progressive corneal thinning and associated with myopia and astigmatism, the shape of the cornea change from sphere to conical shape result in blurring of vision. Corneal collagen cross-linking will stop the progression of keratoconus

The current study aimed to report the visual, refractive and topographic outcome after Trans-epithelial (TE) or epithelial removal (ER) corneal collagen crosslinking in keratoconus patients.
Methods: A convenient sample of 45 eyes with keratoconus in different age (men and women) were included, 25 eyes underwent Trans-epithelial and 20 eyes epithelial removal corneal collagen crosslinking. Detailed ophthalmic examination done for all patients which include, Uncorrected visual acuity, best-corrected visual acuity, Spherical Equivalent, cylinder, K, central corneal thickness, topographical parameters, slit-lamp biomicroscopy finding of cornea and IOP were performed before cross-linking, first, second, and third month after crosslinking.
Results: There were significant differences in mean values between preoperative Uncorrected visual acuity (0.29±0.18) and three month postoperative (0.38±0.17) ($p< 0.003$), preoperative best-corrected visual acuity (0.56±0.25) and three month postoperative (0.65±0.19) ($p< 0.01$) in TE procedure, Preoperative UCVA (0.36±0.19) and three month postoperative (0.43±0.24) ($p< 0.001$), preoperative BCVA (0.47±0.22) three month postoperative (0.77±0.22) ($p< 0.01$) in ER procedure. There were significant differences in mean values between preoperative (42.99±1.7) and three month postoperative (42.11±1.2) in TE type of CXL regarding peripheral zone ($p<0.001$). In TE CXL keratoconus probability index significantly decreased at third month ($p<0.03$).
Conclusion: Collagen crosslinking is safe and good option for stopping the progression of keratectasia in patients with keratoconus. Improvement in UCVA and BCVA with stability in refraction and topographic parameters indicate that keratoconus did not progressed.

Introduction

The cornea is a complex structure, which is responsible for about three quarters of the optical power of the eye.[1] The average corneal diameter is 11.5 mm.[2] Central corneal thickness varies between individuals. It is 0.52 mm thick centrally on average, and thicker towards the periphery, which may reach 0.67mm. [3] The mean corneal power is 43 diopters (D) .[4] The cornea consists of the following layers, each of which is critical to normal function: The epithelium, stroma, Descemet membrane, basement membrane, endothelium**.** [4]

Keratoconus is a disorder characterized by progressive corneal steepening, most typically inferior to the center of the cornea, with eventual corneal thinning, induced myopia, and both regular and irregular astigmatism. [4] Presentation is typically during puberty with unilateral impairment of vision due to progressive myopia and astigmatism, which subsequently becomes irregular. (R)

Retinoscopy shows an irregular 'scissoring' reflex. Slit-lamp biomicroscopy shows very fine, vertical, deep stromal stress lines (Vogt striae), which disappear with pressure on the globe. Epithelial iron deposits may surround the base of the cone (Fleischer ring). Progressive corneal thinning (maximal at the apical zone) associated with poor visual acuity resulting from marked irregular myopic astigmatism with steep Keratometry readings. Bulging of the lower lid in down gaze (Munson sign). [1]

Spectacles or soft contact lenses are generally sufficient in early cases. Rigid contact lenses are required for higher degrees of astigmatism to provide a regular refracting surface. Corneal collagen cross-linking**,** using riboflavin drops to photosensitize the eye followed by exposure to ultraviolet-A light, is a newer treatment which offers promise of stabilization or reversal of ectasia in at least some patients. Keratoplasty may be necessary in patients with advanced disease, especially those with significant corneal scarring. [1] The current study aimed To identify the outcome of visual acuity, and to identify the topographic parameters after crosslinking including Keratometry K readings, keratoconus prediction index (KPI) and probability of keratoconus (KProb).

The study aimed to identify the central corneal thickness (CCT) after crosslinking, as well.

Methods

Subjects: In this prospective study, all patients collected in Hawler Teaching Hospitals in Erbil city, from August 2014 to April 2015. The study included 45 eyes in different age group (men and women) consecutively attending to eye clinic in Hawler Teaching Hospital. The data obtained by direct interview and examination of patients after taking signed consent from all the patients. The authors report no conflicts of interest.

Procedure: A convenient sample of 45 eyes with keratoconus attending eye clinic in Hawler Teaching Hospital they were divided into two groups; group (A) underwent trans-epithelial crosslinking (25 eyes) and the group (B) underwent epithelial removal cross-linking (20 eyes). Detailed ophthalmic examination done for all patients which include, Uncorrected visual acuity (UCVA), best-corrected visual acuity (BCVA), spherical equivalent (SE), cylinder, Keratometry (K), central corneal thickness (CCT), topographical parameters, slit-lamp biomicroscopy finding of cornea and intraocular pressure (IOP) were recorded before cross- linking, first, second, and third month after crosslinking.

Inclusion criteria: include any patients with sign of progressive keratoconus defined as presence of all the following

1. An increase in maximum keratometry (K) readings in several consecutive measurements.
2. Changes in refraction.
3. Patient's reports of deteriorating in visual acuity.

Exclusion criteria are:

1. Age less than15 years.

2. Age over 40 years.

3. Any previous ocular surgery.

4. Corneal thickness less than 400μm**.**

5. Herpetic keratitis.

Statistical Analysis

Data that are collected from patients preoperatively as uncorrected visual acuity, best-corrected visual acuity, Keratometry readings, spherical equivalent, cylinder, central corneal thickness, and topographic parameters, are compared to the data postoperatively to find out the data difference. Collected analysis, enter in a database using Statistical package for Social Sciences (SPSS version 22.0).

Results

Group A: The mean UCVA and BCVA for the first and second months showed no significant changes in comparison to preoperative values, while was higher in the third month with statistically significant improvement ($p < 0.003$) (Table1).

The mean spherical equivalent, mean anterior K, mean posterior K and mean intraocular pressure for the first, second and third month in comparison to preoperative data showed no statistically significant changes (Table2).

The central corneal thickness was statistically decrease throughout the follow up ($p<0.001$ respectively). Probability of keratoconus (Kprob) in the follow up period was not significantly changed in comparison to preoperative data, the keratoconus prediction index (KPI) in the first and second months showed no significant changes but in the third month it was significantly decrease ($p<0.03$) (Table 3).

Group B: The mean UCVA for first and second months was not significantly changed but in the third month showed significant improvement in comparative to preoperative value ($p<0.001$). The mean BCVA in the first month was the same while in the second and third month follow up showed significant improvement in comparison to preoperative data ($p<0.001$ respectively) (Table 4).

The spherical equivalent in the first month showed significant increase ($p<0.01$, $p<0.03$ respectively) in comparison to preoperative data while in the second and third month were not significantly changed in comparison to preoperative data. Mean K and mean posterior K were not significantly changed throughout the follow up time. The IOP throughout the follow up showed no significant changes (Table 5).

The central corneal thickness was significantly decreased ($p<0.001$) throughout the follow up months. The probability of keratoconus (Kprob) showed significant decrease ($p<0.001$) in the third month but there were no significant changes in the first and second month. Keratoconus prediction index (KPI) was increased at third month ($p<0.001$) but in first and second month was stable. (Table 6).

For the comparison between the two groups, the mean UCVA and mean BCVA showed more statistically significant improvement in groupB ($p<0.018$, $p<0.024$ respectively) than in group A (Table 7).

Keratoconus prediction index (KPI) in group A was statistically decreased in third month while in group B the probability of keratoconus (KProb) was statistically decreased in third month follow up (Table 8).

For other variables, spherical equivalent, mean K, mean posterior K, anterior axial curvature zones, central corneal thickness, IOP showed no significant changes between the two groups. No patient developed haze in group A, and in group B in first month only nine eyes (20%) developed 1+ haze and two eyes (4.4%) developed 2+ haze, in the second month only eight eyes (17.8%) remained 1+ haze and in third month only three eyes (6.7%) remained 1+ haze.

Table 1: (Group A): Comparison between preoperative Mean± Standard Deviation of UCVA and BCVA with first, second, and third month.

	Preoperative (Mean±SD)	First month (Mean±SD)	Second month (Mean±SD)	Third month (Mean±SD)
UCVA (Decimal)	0.29±0.18	0.29±0.16	0.32±0.19	0.38±0.17 p<0.003
BCVA (Decimal)	0.56±0.25	0.56±0.21	0.58±0.2	0.65±0.19 p<0.01

Table 2: (Group A): Comparison between preoperative mean± SD of SE, keratometry, posterior keratometry and IOP with first, second, and third month.

	Preoperative (Mean± SD)	First month (Mean± SD)	Second month (Mean± SD)	Third month (Mean± SD)
Spherical equivalent (Diopter)	-3.61±3.5	-3.72±3.5	-3.8±3.7	-3.45±3.6
Anterior K (Diopter)	46.89±3.2	47.08±3.2	46.85±3	46.88±3.1
Posterior K (Diopter)	-7.05±0.7	-7.07±0.8	-7.08±0.7	-7.07±0.7
IOP (Diopter)	14.8±1.5	15±1.4	14.7±1.4	14.5±1.4

Table 3: (Group A): Comparison between preoperative Mean± SD of central corneal thickness, KProb and KPI with first, second, and third month.

	Preoperative (Mean± SD)	First month (Mean± SD)	Second month (Mean± SD)	Third month (Mean± SD)
Central corneal thickness μm	503.4±41.7	493.2±45.1 p<0.001	493.2±43.9 p<0.001	493.8±44.7 p<0.001
KProb %	91.2±21.3	86±32.3	84.9±32.3	82.9±34
KPI %	67.7±28.7	67.4±32.1	62.5±31.4	59.2±31.4 p<0.03

Table 4: (Group B): Comparison between preoperative Mean± SD of UCVA and BCVA with first, second, and third month.

	Preoperative (Mean± SD)	First month (Mean± SD)	second month (Mean± SD)	Third month (Mean± SD)
UCV A (Decimal)	0.36±0.19	0.35±0.2	0.35±0.2	0.43±0.24 p<0.001
BCV A (Decimal)	0.47±0.22	0.63±0.2	0.75±0.22 p<0.01	0.77±0.22 p<0.01

Table 5: (Group B): Comparison between preoperative Mean± SD of spherical equivalent, cylinder, anterior kerarometry, posterior kerarometry and IOP with first, second, and third month.

	Preoperative (Mean± SD)	First month (Mean± SD)	Second month (Mean± SD)	Third month (Mean± SD)
Spherical equivalent (Diopter)	-3.01±2.7	-3.6±2.9 p<0.01	-3.2±2.5	-2.9±2.4
K (Diopter)	46.94±2.2	47.33±2.09	46.94±2.3	46.83±2.2
Posterior K (Diopter)	-7.12±0.7	-6.4±3.8	-7.12±3.9	-7.28±0.6
IOP (mmhg)	14.55±2.1	13.6±2.1	13.4±1.9	13.4±2.2

Table 6: (Group B): Comparison between preoperative Mean± SD of central corneal thickness, KProb and KPI with first, second, and third month.

	Preoperative (Mean± SD)	First month (Mean± SD)	second month (Mean± SD)	Third month (Mean± SD)
Central corneal thickness μm	496.8±28.8	463.2±28.5 p<0.001	455±22.8 p<0.001	462.6±25.5 p<0.001
KProb %	80.19±28.9	81.2±30	80.19±30	80.05±29.1 p<0.001
KPI %	52.27±27.4	56.2±29.4	51.28±27.7	50.14±27.7 p<0.001

Table 7: Comparison between preoperative mean± SD of UCVA and BCVA with third month between the two groups.

	UCVA preoperative (Mean± SD)	UCVA third month (Mean± SD)	BCVA preoperative (Mean± SD)	BCVA third month (Mean± SD)
Group A	0.296±0.18	0.38±0.17	0.56±0.25	0.65±0.19
Group B	0.36±0.19	0.52±0.19 p< 0.018	0.47±0.22	0.79±0.19 p< 0.024

Table 8: Comparison between preoperative Mean± SD of KProb and KPI with third month between the two groups.

	KPI preoperative (Mean± SD)	KPI third month (Mean± SD)	KProb preoperative (Mean± SD)	KProb third month (Mean± SD)
Group A	67.76±28.7	59.25±31.4 p< 0.028	91.27±31.4	82.92±34 p< 0.001
Group B	52.27±27.4	50.14±27.7 p< 0.001	80.19±28.9	80.05±29.1 p< 0.027

Discussion:

In this study, we analyzed refractive and functional outcomes of Epithelial removal and Trans-epithelial cross-linking in patients with progressive keratoconus, in order to assess the effectiveness of the two treatments. Collagen cross-linking is a treatment of choice for stopping the progression of keratoconus by increasing the corneal rigidity.

In 25 eyes that underwent Trans-epithelial cross-linking this study found that the mean UCVA in the first and second months showed no statistically significant improvement with the baseline preoperative value ($p= 0.275$, $p = 0.872$) respectively, 20 while in the third month showed statistically significant improvement ($p< 0.003$).

The mean BCVA at first and second month was not significantly changed, but started to improve significantly at third month ($p =0.01$) (Table 1) **.** The same result was found in a study done by Filippello M et al in 2012 on 20 patients with bilateral keratoconus the worst eye was treated with Trans-epithelial cross-linking, while the fellow eye was left untreated as a control, and they showed significant improvement in UCVA and worsening of the untreated control eyes .[21] A study done by Derakhshan et al. in 2011 on short term outcome of collagen cross-linking on thirty one eyes and they found that postoperatively, UCVA increased by 2 Snellen lines and BCVA was improved by 1.7 Snellen lines ($P <0.001$) at third month after Trans-epithelial cross-linking.[7] In this study the SE showed no gross difference in the third month ($P = 0.385$, $P=0.349$) respectively (Table 2).

In a study done by Rossi et al. in 2012 on standard versus Trans-epithelial collagen cross linking in keratoconus patients showed that SE and cylinder not significantly changed in the third month follow up with the baseline values.[11] Derakhshan et al (2011) showed that SE decreased by 0.55D in the third month post cross-linking in patients with keratoconus.[7] The CCT starts to decrease significantly from the first month, and was stable throughout the second and third month ($P < 0.001$) (Table 4) **.**

Messmer (2013) in a study on updates on cross-linking in keratoconus, pointed out a significant decrease in CCT in eyes underwent Transepithelial corneal cross-linking. This may be due to collagen compression, changes in corneal hydration state and keratocyte apoptosis. [13] In the same study done by Rossi et al. (2015), they found out that in Trans-epithelial cross-linking there is no significant change in CCT between baseline and third month data.[12]

The mean K, and mean posterior K in this study showed no significant decrease in the third month in comparison to preoperative values (P = 0.947, P =0.439) respectively but were stable throughout the follow up period (Table 2)**.** The same results was proved by another study in the authors noticed that mean K, and mean posterior K, had no significant difference in the third month with the preoperative values.[14]

Mean Probability of keratoconus (KProb) showed a decrease but no statistically difference between preoperative data with third month follow up. Mean keratoconus prediction index (KPI) was decreased in the third month in comparative to preoperative data (P = 0.03) (Table 4)**.** In a study done by Ramani et al on Keratoconus indices in monitoring keratoconus and he found out that there were significant difference in KProb and KPI between normal eye and keratoconus and thy are important parameters for follow up in keratoconus.[16] IOP at third month follow up was unchanged in comparative to preoperative data (P=0.34), the same result was found by Kilic and Roberts.[11]

In 20 eyes who underwent Epithelial removal corneal cross-linking, the mean UCVA for first and second months follow up were similar with preoperative UCVA but in the third month showed significant improvement. The mean BCVA in the first month was improved but not significant while in the second and third month showed significant improvement ($p<0.001$) ($p<0.001$) respectively (Table 5)

A study done by Caporossi et al. showed significant improvement in UCVA and BCVA three month post cross-linking.[15] Wollensak et al in their study in 2003 on Riboflavin/ultraviolet-A induced collagen cross linking for the treatment of keratoconus they found improvement in BCVA after Epithelial removal cross linking.[17]

Mean K and mean posterior K was stable through three months of follow up and no significant difference with the preoperative values (Table 6). The study done by Grewal et al. in 2009 on Corneal collagen cross linking using riboflavin and ultraviolet-A light for keratoconus found out that in Epithelial removal corneal cross-linking there was no significant differences in mean SE, mean cylinder, mean K and mean posterior K at third month with preoperative readings. [14]

KPI showed significant increase in third month follow up ($p< 0.001$), KProb showed significant decrease ($p< 0.001$) (Table 8). [16] The results of mean CCT were significantly decreased starting from the first month. A study done by Legare ME et al in 2013 on thirty nine eyes showed that CCT decreases significantly three month after Epithelial removal cross-linking.[20] The same result was signed out by Guber et al. study and they found that there is significant decrease 44.0 μm at three month in CCT in eyes underwent Epithelial removal cross-linking, and almost returned to preoperative value at 12 months. [21]

In this study no cases reported to have corneal haze post-operative in group A. In group B at first month only nine eyes (20%) developed 1+ haze and two eyes (4.4%) developed 2+ haze, at the second month only eight eyes (17.8%) remained 1+ haze and at third month only three eyes (6.7%) remained 1+ haze. Greenstein et al. showed that the corneal haze was greatest at 1 month ($p<0.001$), decreased at 3 months ($p=0.6$) and was significantly decreased between 3 month to 12 month ($p<0.001$) post cross-linking. [22]

Finally in this study, a comparison between the visual, refractive and topographic out comes of both Epithelial removal and Trans-epithelial corneal collagen cross linking revealed a statistically significant visual improvement both UCVA and BCVA and mean KProb in Epithelial removal collagen cross-linking and corneal haze only was found in Epithelial removal cross-linking

Conclusion:

Collagen crosslinking may be a new way for stopping the progression of keratectasia in patients with keratoconus. The need for penetrating keratoplasty might then be significantly reduced in keratoconus. Uncorrected visual acuity and best-corrected visual acuity are improved in spite of non-significant change in refraction, as well anterior and posterior corneal curvature in epithelial removal crosslinking and Trans-epithelial corneal collagen crosslinking three month postoperative. CCT decrease significantly, stable mean K, mean posterior K indicate that keratoconus did not progress. No significant change in IOP during the follow up time. **L**onger follow up period and evaluation as well as larger sample size are recommended.

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Effects of Olmesartan on Arterial Blood Pressure in Salt-Loaded Rabbits Receiving Infusions of Angiotensin II

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Abstract

Background and Objectives: Olmesartan proved to be quite effective in lowering blood pressure (BP) in rabbits received intracarotid (IC) infusion of angiotensin II (AngII) by blocking angiotensin type 1 receptors (AT1) competitively in brain sites outside the blood brain barrier accessible to AngII and also in the periphery. Until now, no studies have been done to examine this effect of Olmesartan in salt-loaded rabbits to intravenous (IV) and IC infusions of Ang II, therefore this study is performed.

Methods: After two weeks of salt-loading, local domestic rabbits were given IV or IC infusions of AngII (10ng/kg/min).The effects of AngII were first investigated alone. When the pressor effect was clearly apparent, Olmesartan was injected intravenously as a single dose of 0.6mg/Kg. The second dose of Olmesartan was injected after recovery when the BP recording was reasonably stable. The BP and heart rate (HR) were evaluated.

Results: Both IV and IC infusions of Ang II induced moderate but highly significant increases in arterial BP. Intravenous injection of Olmesartan produced essentially no change in BP, whereas the same dose induced clear-cut hypotension during IC infusion of Ang II. The pressor response to AngII was totally prevented by Olmesartan. The hypotensive effect of Olmesartan has disappeared after 30-60min indicating a relatively short elimination half-life of the drug in rabbits. The HR remained unchanged.

Conclusions: The rapid inhibition of the pressor response of Ang II by Olmesartan confirms a direct pressor effect of Ang II and reduces the role of other endogenous pressor substances.

Keywords: Olmesartan, Blood Pressure, salt-loading, Angiotensin II, Hypertention.

Introduction

Hypertension is known to be a major risk factor for cardiovascular, cerebrovascular and renal diseases including stroke, sudden cardiac death, and coronary artery diseases. The control of blood pressure (BP) in hypertensive patients can markedly reduce morbidity and mortality resulted from these lethal complications and save lives.[1,2,3] The number of adults with hypertension in 2025 is predicted to increase by about 60% to a total of 1.56 billion.[4]

Angiotensin II (Ang II) which is a potent vasoconstrictor that increases total peripheral resistance, is involved in the pathogenesis of essential hypertension, congestive heart failure, renovascular hypertension and renal diseases associated with hypertension.[5,6] These conditions have been treated with renin-angiotensin system blockers like Omlesartan which competitively antagonize the angiotensin II receptors and produce BP lowering effects.[5]

Ang II has been shown to be 10 times more active than noradrenaline in increasing the BP[7] and directly increases sodium reabsorption in the proximal tubule. It also alters renal hemodynamics and causes the release of aldosterone from the adrenal cortex.[8,9] Several mechanisms are involved in the pressor response to Ang including direct vasoconstriction, enhancement of both sympathetic discharge and catecholamine release.[10,11] These biological actions of Ang II are mediated by cell surface receptors, Ang receptors, type 1 (AT1) and type 2 (AT2). AT1 receptors which Olmesartan binds to, have been localized in the kidney, heart, vascular smooth muscle cells, brain, adrenal gland, platelets, adipocytes, and placenta.[12]

The antihypertensive effects of Olmesartan were demonstrated in seven placebo-controlled studies in a total of 2,693 patients with essential hypertension at daily doses ranging from 2.5 to 80 mg during short-term treatment of 6 to 12 weeks, each showing statistically significant reductions in peak and trough BP.[13,14] In addition to the periphery's role of Ang II in the control of BP, it plays an important role within the brain in the pathogenesis of hypertension and other cardiovascular disorders. Some studies reveal that the circulating Ang II is unable to cross the blood brain barrier (BBB) except in some disease when BBB is disrupted.[15] However, all components of the peripheral renin-angiotensin system (RAS) are also found in the brain but the role of endogenous RAS involving in cardiovascular disorders are still not fully understood.[16]

Additionally, Ang II in the brain regulates numerous physiological responses through its central actions in the brain, where it functions as a neurotransmitter or neuromodulator to influence BP, drinking behavior, salt appetite, and several neuroendocrine processes. Some of these responses are induced by the actions of circulating Ang II at the circumventricular organs (CVOs) and other

specialized regions, and others are influenced by locally formed Ang II generated within the brain itself. Although circulating hormones are effectively excluded from most parts of the brain by the BBB, neurons in the CVOs are accessible to many circulating ligands via the fenestrated endothelial cells of their dense capillary circulation. The pressor response to circulating Ang II is mediated partially by the area postrema and the subfornical organ (SFO), highly vascularized organ in the brain which does not have a BBB.[16,17,18]

Many studies have shown that the fall in blood pressure with salt reduction is significantly related to the degree of activation of the RAS, i.e. the greater the rise in plasma renin activity (PRA), and therefore Ang II and aldosterone, the smaller the fall in blood pressure.[19-25] When the RAS is blocked by an Angiotensin Converting Enzyme Inhibitor (ACE-I), BP becomes much more dependent on sodium and water balance, and changes in salt intake have much larger effects on BP.[26]

The aim of this study is to evaluate the effect of the angiotensin type 1 (AT1) receptor blocker (Olmesartan) on blood pressure and heart rate responses to Ang II given intacarotidly (IC) to salt-loaded rabbits.

Methods

Study design

The local domestic rabbits (Oryctolagus cuniculus) of both sexes weighted (1.2-2.0 kg) were used in this study. The animals were kept in the animal house of the college of medicine with a room temperature of 18-25 ^{o}C and maintained on normal available food (barley and vegetables) and considered to be salt loaded after giving them 0.9% saline as drinking water for at least 2 weeks. The body temperature was kept at 37-37.5 °C. The rabbits were deprived of food for 15-18 hours before experimental use and then prepared for experimental procedures under an anesthetic regimen consisting of a combination of phenobarbitone (100 mg/kg body weight) and urethane (1 gm/kg body weight) intraperitoneally.[27,28] Surgical anesthesia was reached in about 15 minutes after urethane administration. Thereafter, supplementary small doses of urethane were injected intravenously (IV) as required to maintain deep and prolonged anesthesia because the administrated dose of urethane represented 1% of the recommended anesthetizing dose usually used in rabbits[28]. A tracheostomy was performed to allow free ventilation and for avoiding tracheal obstruction in animal with long-term anesthesia. In addition, the mucus and other secretions were regularly removed by suction using a syringe connected to a polythene tube.

Preparation of animals for experiments

For BP measurement, the carotid artery of the rabbit was cannulated as shown in figure 1. The arterial blood pressure was recorded by connecting the carotid artery cannula to a BP transducer. The

arterial cannula connection was through a 3-way stop-cock attached to a syringe containing heparinized isotonic saline. The blood pressure transducer was in turn connected to a two channel oscillograph and to a mercury manometer for calibration. The process of calibration allows the determination of the range of BP in which the blood pressure of the animal is recorded.

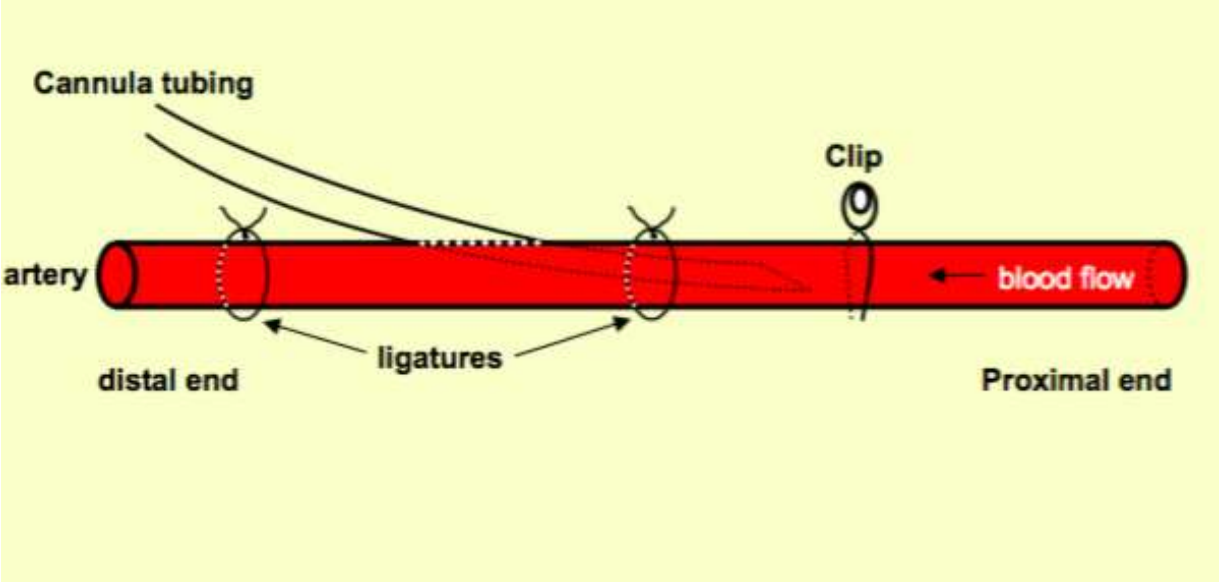

Figure 1: A diagram showing cannulation of the carotid artery.

The heart rate was determined in the rabbits by palpitation based on the method described by Dizaye in 1998 [27] in which, the heart rate is recorded from the BP trace. Each pulse in the artery is transmitted to the physiological recorder as an upward deflection representing the systolic pressure, followed by a downward deflection representing the diastolic pressure (see Figure 2). A cardiac cycle, on the recording paper consists of an upward deflection and a downward deflection. The number of cardiac cycles (beats) per unit of time can be determined from the speed at which the paper of the recorder is running.

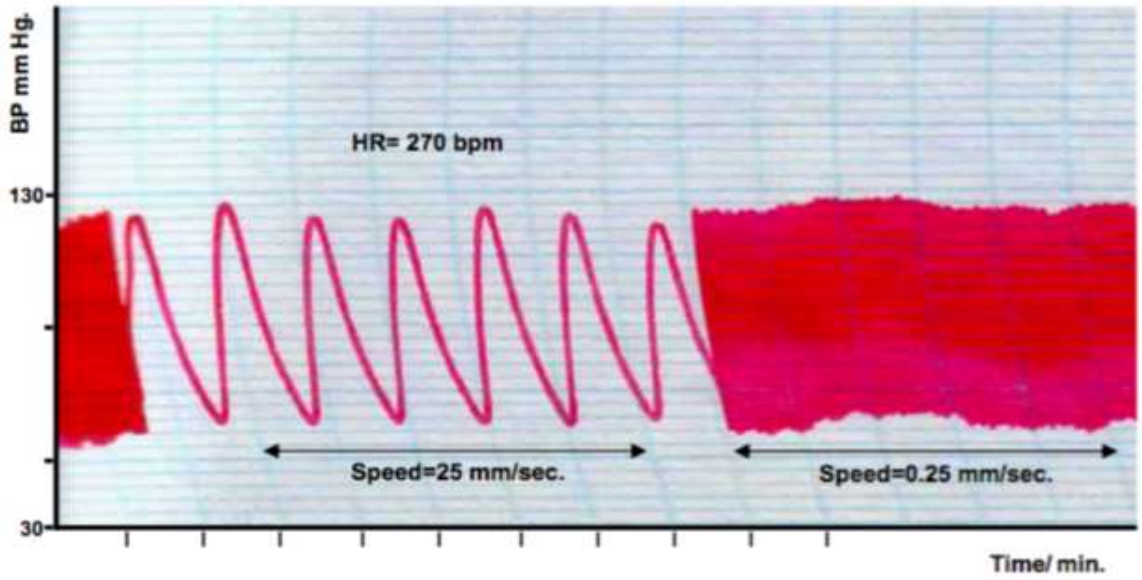

Figure 2: A trace of arterial BP recording showing cardiac cycles per second.

Ang II in a dose of 10 μg/ml was infused intracarotidly in a rate of 10 ng/kg/min. This rate of the hormone produced a moderate rise in BP of about 10-15 mm Hg. The IC infusion was performed depending on a method employed previously in the rabbits by Hamad in 1995.[29] A 27-gauge dental needle attached to pp 25 polythene tubing was inserted into the carotid artery in the direction of blood flow. The advantages of this method is that it allows IC infusion or injection without blocking the normal blood flow through the artery and also, the arterial puncture made by the needle is so small that no bleeding occurs even upon withdrawal of the needle at the end of each experiment.

A single dose of 0.6 mg/kg Olmesartan (IV) was administrated to the animals. This dose was chosen following many trails and it is within the range of effective antihypertensive daily doses used in humans. During the course of each experiment, Olmesartan injection was freshly prepared. Two tablets of Olmesartan were dissolved properly in 50 ml of sterile normal saline and filtered before injection.

The effects of IC infusion of Ang II were first investigated alone. When the pressor effect was clearly apparent, Olmesartan was injected intravenously as a single dose of 0.6 mg/Kg. After allowing 30–60 minutes of recovery as a control period, and when the BP recording was reasonably stable, a second similar dose of Olmesartan was injected. The HR was measured as previously described.

Statistical analysis of results

The results were evaluated statistically by using the Statistical Package for the Social Sciences (SPSS) computer program. All results are quoted as mean ± the standard error of the mean. In the experimental designs used, both control and experimental treatments were given to the same animal. The experimental results were evaluated mostly by t-test for paired samples. Changes were considered statistically significant when P value was less than 0.05; where P is the probability that an observed change or difference might have occurred by chance.

Results

The effects IC infusions of Ang II on arterial BP in salt-loaded rabbits:

The angiotensin infusion intracarotidly induced a significant increase in arterial BP in a range of 11-15 mm Hg (see Figures 3).

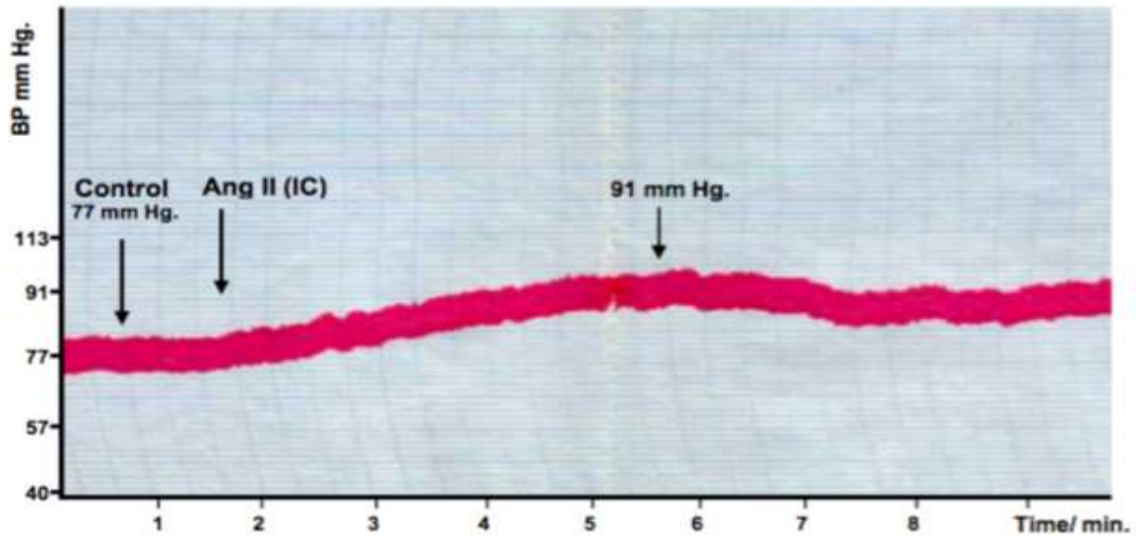

Figure 3: Blood pressure traces showing the pressor responses to Ang infusion (10 ng/kg/min) IC

The effects of Olmesartan on arterial BP and heart rate in salt- loaded rabbits receiving IC infusion of Ang II:

Intracarotid infusion of Ang II at a rate of 10 ng/kg/min produced a consistent and highly significant increase in arterial BP (Table 1). During the pressor response to Ang II, the IV injection of Olmesartan (0.6 mg/kg) clearly and rapidly reduced the arterial BP (Table 1 and Figure 4). This hypotensive effect of Olmesartan lasted about 30 minutes. Thereafter, the effect gradually faded out and complete recovery occurred approximately after one hour from the injection. There was almost no change in HR during these experimental treatments (Table 2).

Table 1: The effects of Ang II (10 ng/kg/min) infusion intracarotidly, alone and in combination with IV injection of Olmesartan (0.6 mg/kg) on arterial BP in salt-loaded rabbits.

Experiment No.	Control (A)	Ang II, IC (B)	Ang II+Olmesartan (C)
1	83	95	70.5
2	84	100	60
3	54	65	46
4	114	135	84
5	67	80	53
6	68	81	42
Mean±SE mmHg.	78.33±8.47	92.66±9.85	59.25±6.45
Statistical evaluation, students t-test for paired samples (P)			
A vs B	P < 0.0005		
A vs C	P < 0.003		
B vs C	P < 0.001		

Table (2): The effects of IC infusion of Ang II (10 ng/kg/min.), Ang II plus IV injection of Olmesartan (0.6 mg/kg) on HR in salt-loaded rabbits.

Treatments	**Control n=10**	**Ang II, IC n=6**	**Ang II+Olmesartan n=7**
Mean±SE (bpm)	**277.6 ±10.1**	**272.3 ±15.3**	**273.1 ±13.8**

Statistical evaluation by comparison between the means showed no significant differences.

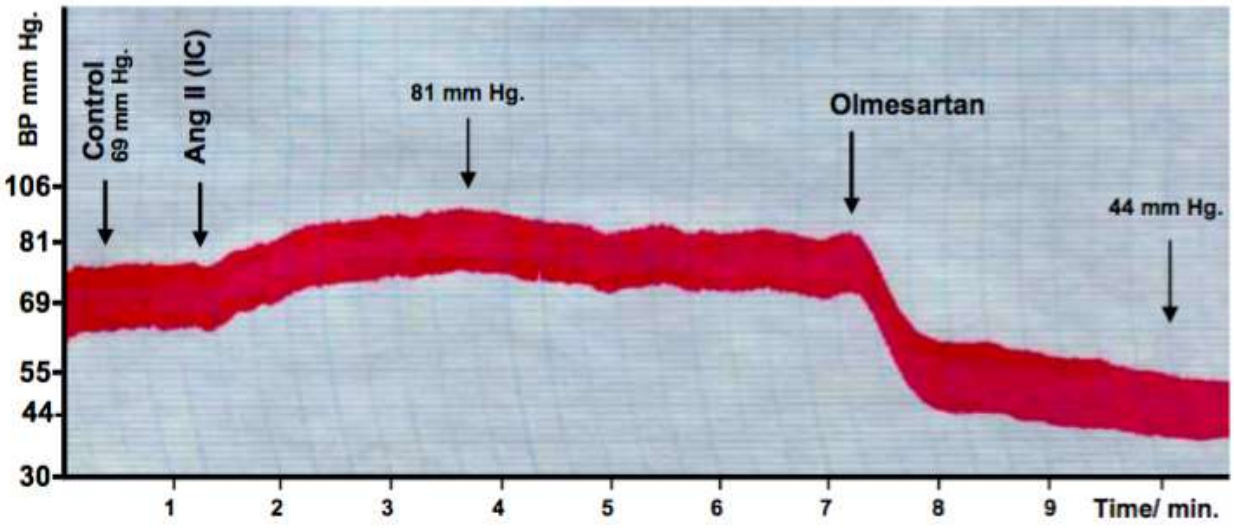

Figure 4: The effects of Olmesartan (0.6 mg/kg, IV) on the pressor response to IC infusion of Ang II (10 ng/kg/min). The recording shows a typical hypotensive response to Olmesartan in one rabbit.

The effect of Olmesartan injection on arterial BP in salt-loaded rabbits:

When the blood pressure recording was continuous and reasonably stable during control measurements, the dose of 0.6 mg/kg of Olmesartan injected intravenously produced no detectable change in arterial BP (Table 3).

Table 3: The effect of Olmesartan injection (0.6 mg/kg, IV) on BP in salt-loaded rabbits.

Experiment No.	Control	Olmesrtan
1	**65**	**59**
2	**53**	**58**
3	**62**	**62**
4	**77**	**73**
5	**94**	**95**
6	**77**	**78**
Mean±SE mmHg.	**71.3 ±5.89**	**70.8 ±5.83**

Statistical evaluation by student's t. test for paired samples showed no significant change.

Discussion

The use of relevant animal models to study human cardiovascular diseases gives useful information to understanding the causes and the potential treatments. Different animal models have been used in induction of experimental hypertension and these animals are also tools in the studying the pathophysiology of hypertension and its complication.[30]

In the present study, the animals were salt loaded at the start of the experiment with an aim to cause inhibition of renin secretion and to reduce the subsequent formation of Ang II. This led to reduced renin activity experimentally and the effects of administrated Ang II exogenously can be easily detected.

Referring to values of arterial BP during control periods in tables 1 and 3, the mean is equal to 74.8±7.2 mm Hg. This value lies within the normal range of blood pressure (73-104 mm Hg) reported by Weisbroth et al. in 1974.[31] The arterial BP significantly increased in response to IC infusion of Ang II (Figure 3). A proportion of the Ang II that is infused into the carotid artery is expected to react with Ang receptors in central areas outside the BBB, and the rest flows into peripheral circulation. Therefore, the plasma concentration of Ang in the peripheral blood would be lower than that will be produced by IV infusion and hence a smaller rise in arterial BP results from the direct vasoconstrictor effect of angiotensin.

Intravenous injection of Olmesartan in a dose of 0.6 mg/kg produced essentially no change in arterial BP (Table 3). Whereas the same dose proved to be quite effective in producing hypotension after the animals received IC infusion of Ang II (Table 1, Fig. 4). In control periods, the salt-loaded rabbits received a relatively high infusion of isotonic saline, conditions that reduce the circulating levels of Ang II and upregulates Ang receptors.[32] In such conditions when Olmesartan is given, it binds to AT1 receptors but without affecting the baseline BP levels because of the minimal concentrations of plasma angiotensin. However, when Ang is infused, the arterial BP is increased. This pressor response is totally prevented and the BP is further reduced by Olmesartan competitively blocking AT1 receptors in brain sites accessible to Ang and also in the periphery. The significant reduction of arterial BP below the control baseline value may be due to Ang II activating AT2 receptors resulting in vasodilation.[12,33]

The fact that the pressor response to IC infusion of Ang was rapidly inhibited within seconds following Olmesartan injection, confirms the direct effect of Ang in this pressor response. In other words, an indirect role of other hormonal factors like vasopressin release may be excluded. However, a central effect of Ang II resulting in rapid excitation of sympathetic activity cannot be ruled out. The hypotensive effect of Olmesartan has disappeared after 30-60 min. indicating a relatively short elimination half-life of the drug in rabbits compared to 10-18 hours in man.

Conclusion

Olmesartan proved to be quite effective in lowering blood pressure in animals received IC infusion of Ang II. This effect is due to blocking AT1 receptors competitively in brain sites accessible to Ang II and also in the periphery. The rapid inhibition of the pressor response to IC infusion of Ang II by Olmesartan confirms a direct pressor effect of Ang II and reduces the role of other endogenous pressor substances.

Conflicts of Interest

The author reports no conflicts of interest.

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Diagnostic accuracy of ultrasonography to distinguish between benign and malignant solid breast masses

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Abstract

Background: Ultrasound is an important imaging modality in the assessment of palpable breast masses. It has become a valuable tool to use along with mammogram because it is widely available, portable, non- invasive , not using ionizing radiation , and less expensive than other options.

Objectives: to determine the accuracy of ultrasonography to distinguish between benign and malignant solid breast masses and comparing it with histopathological results obtained from biopsy of breast mass.

Patients and methods: This is a Cross sectional study , conducted in Rizgary Teaching Hospital / Radiology Department and Maternity Teaching Hospital /Breast Center in Erbil from April 2014 to March 2015 . Ultrasonographic evaluation of 100 patients with breast lumps was done . Diagnosis was made considering four features of the lumps i.e. shape, margins, width, A/P ratio and echogenicity. Diagnosis was confirmed by fine needle aspiration cytology or histopathology.

Results: the validity of ultrasonography in the differentiation of breast masses was calculated. A sensitivity value of 100%, specificity of 78.3%, positive and negative predictive values of 67.5% and 100% respectively with accuracy of 85% were noted . Among the multiple ultrasonographic parameters, all were significant in the diagnosis of benign versus malignant masses except the maximum diameter .

Conclusion: this study shows that sonography is useful in characterization of breast masses.
Attention must be paid to combination of sonographic features rather than any single characteristic.

Key words: Breast Mass, Benign, Malignant, Ultrasonography

Introduction

Breast cancer is one of the most common cancers to affect women in the developed world. It has been speculated that the lack of an early cancer detection program is responsible for the majority of women presenting at a late, symptomatic stage when cure is impossible.[1] Unlike many cancers, breast cancer is not dominantly a disease of the elderly, it affects young women.[2]

The Risk factors for breast cancer increases with age , nulliparous,[3]and upper class female are more affected than lower social class females and Unmarried are affected more than married women.[4] Also increases in the nulliparous ,Early age at menarche <12 years, late age of menopause >55.

Ultrasound is an important imaging modality in the assessment of palpable breast masses. Its main role has been differentiating cystic from solid masses Though the use of ultrasound is determined by the patient age and nature of the breast lesion.[5] It has become a valuable tool to use along with mammogram because it is widely available, portable, non- invasive , not using ionizing radiation , and less expensive than other options.[6]

The purpose of this study is to evaluate the accuracy of ultrasonography to distinguish between benign and malignant solid breast masses and comparing it with histopathological results obtained from biopsy of breast mass.

Malik G, et al proves the efficacy of ultrasound as a method of choice to evaluate breast masses in young patients avoiding the need of biopsy, and also reflect that the benign diseases dominate the disease spectrum in young patient. The sensitivity was more for benign 92% than malignant lesions 67% and its specificity was high for malignant lesions 92.4%.

Methods

Ultrasonographic evaluation of 100 female with breast masses was done in Radiology Department of Rizgary Teaching Hospital and Maternity Hospital breast centre- Erbil between April 2014 to March 2015.

One hundred patients were found to have breast masses on ultrasound, a total of 13 patients were excluded, because 10 of them were simple cystic masses and 3 patients of them due to lack of histological result or inconclusive Fine Needle Aspiration (FNA).

A total of 87 patients with breast masses were included in this study, many of these masses underwent truecut biopsy, and some masses underwent US guided Fine Needle Aspiration Cytology and had a conclusive diagnosis.

The patient laid supine , the ipsilateral arm comfortably raised and placed under the neck to help spread out the breast, keep the breast firm on to the chest wall and allow better evaluation of the axillary region, and then the patient turned slightly in oblique position to scan the breast

A high frequency 7.5MHz linear array transducer with US equipment (Siemens sono line prima Unit Germany) was used to scan both breasts. Sonographic gel was applied over the skin of the entire breast including the axilla. The probe was gently applied over the mass and both sagittal and transverse scans were done radially as shown in figure (2). The axilla was scanned to check for any associated lymphadenopathy. This procedure was done on both breasts. For a large glandular breast more compression with the transducer have been required to obtain better penetration.

The location of lesion was labeled according to the breast quadrants and the distance from the nipple.

The scans included information regarding the four features of the palpable breast mass:-

1. Shape: Round/ Oval or irregular margin ,well define or irregular margin.

2. Margins : well defined or ill defined

3.Orientation of solid mass: taller than wide or wider than tall.

4.Echogenicity: hyperechoic , isoechoic or hypoechoic.

The prospective classification of the masses into benign or malignant categories was performed based on previously published criteria which were established by Stavros et al.[8]

To be classified a solid mass as malignant, a mass need to have any of the following characteristics: spiculated contour, antiparallel orientation, marked hypoechogenicity, posterior acoustic shadowing, microlobulation or duct extension as shown in figure (2and3). If even a single malignant feature was present the mass was excluded from the benign classification..

We classified masses as benign, if they had no malignant characteristics and also demonstrated 1 of the 3 following combinations of benign characteristics: 1) intense uniform hyperechogenicity; 2) wider than tall (parallel orientation along with a thin, echogenic capsule; 3) two or three gentle lobulations and a thin echogenic capsule as shown in figure (1).

On the bases of the above features, an impression about diagnosis was made from ultrasound. Confirmation of ultrasound results was made by fine needle aspiration cytology or core biopsy done by expert pathologist in the department of pathology.

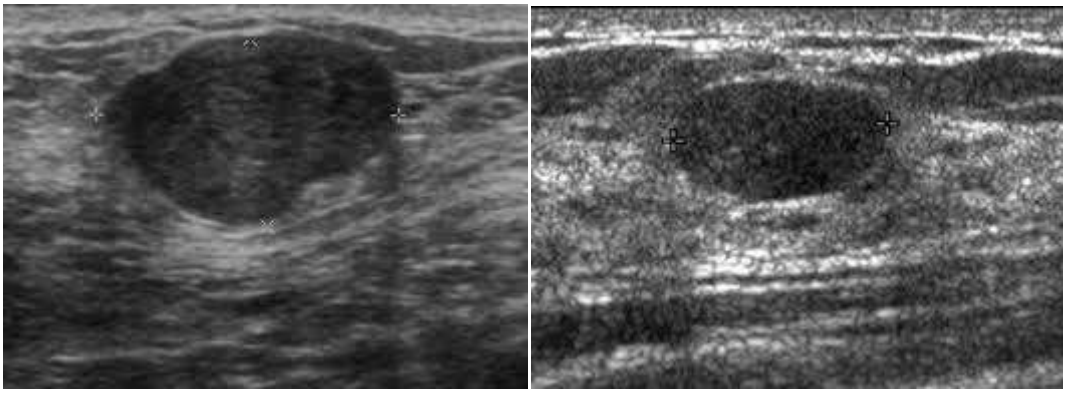

Figure 1: Ultrasound image of benign mass, reviewed a well circumscribed benign fibroadenoma.

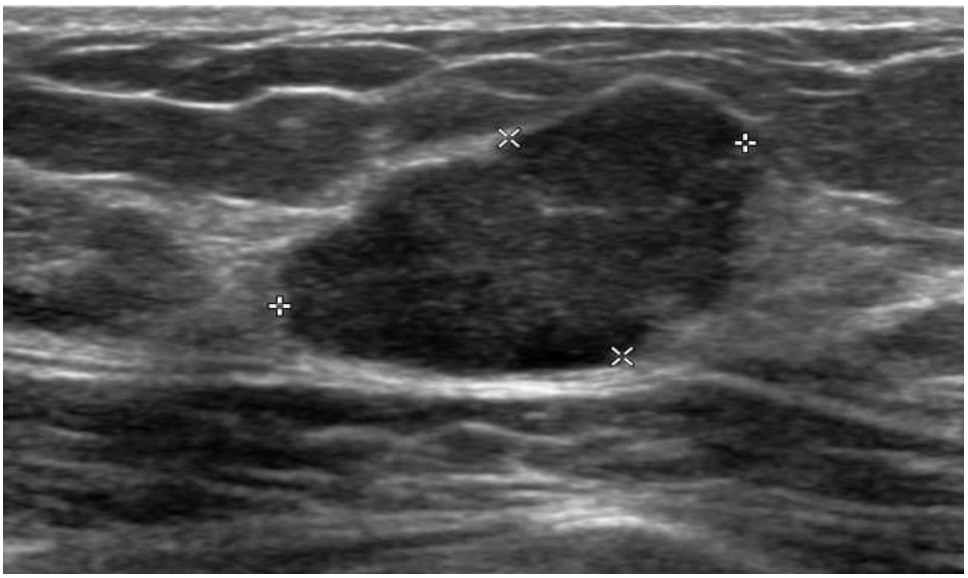

Figure 2: Ultrasound image of infiltrative ductal carcinoma . hypoechoic irregular outline breast mass in a 20 years old patient .

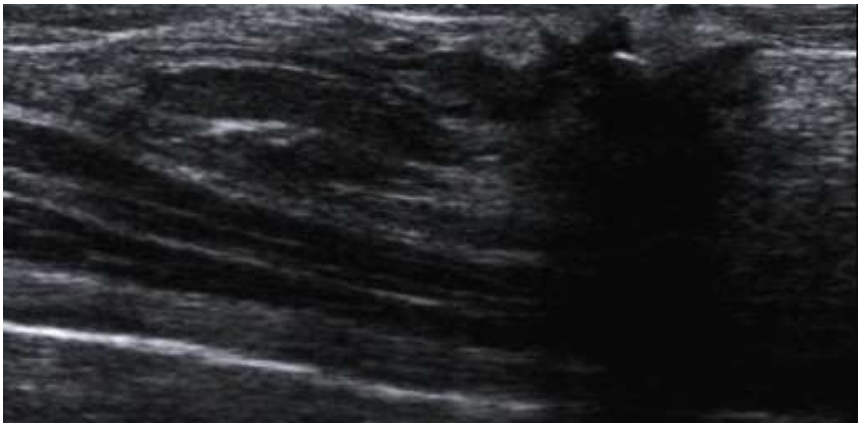

Figure 3: Ultrasound image of malignant mass, Targeted ultrasound of the right breast showed a 16mm poorly defined irregular hypoechoic solid mass with posterior acoustic shadowing, consistent with malignancy.

Results

A total of 87 female patients with solid breast masses have been included in the study; their average age was approximately 34 years with S.D of 9.5 years, 75.9% of them were young. The mean diameter ± S.D of their breast mass were 28 ± 15 mm respectively. Majority of the participants (84%) had no family history of breast cancer as shown in (Figure 4). Half of the patients seeked medical care after feeling a palpable mass as shown in (figure 5).

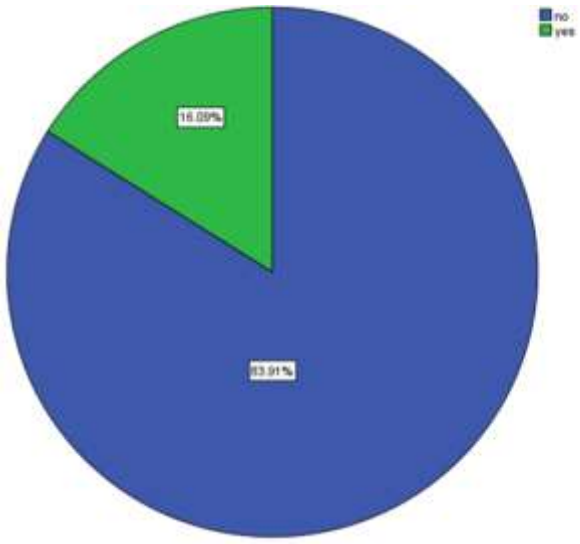

Figure 4: Family history of breast cancer

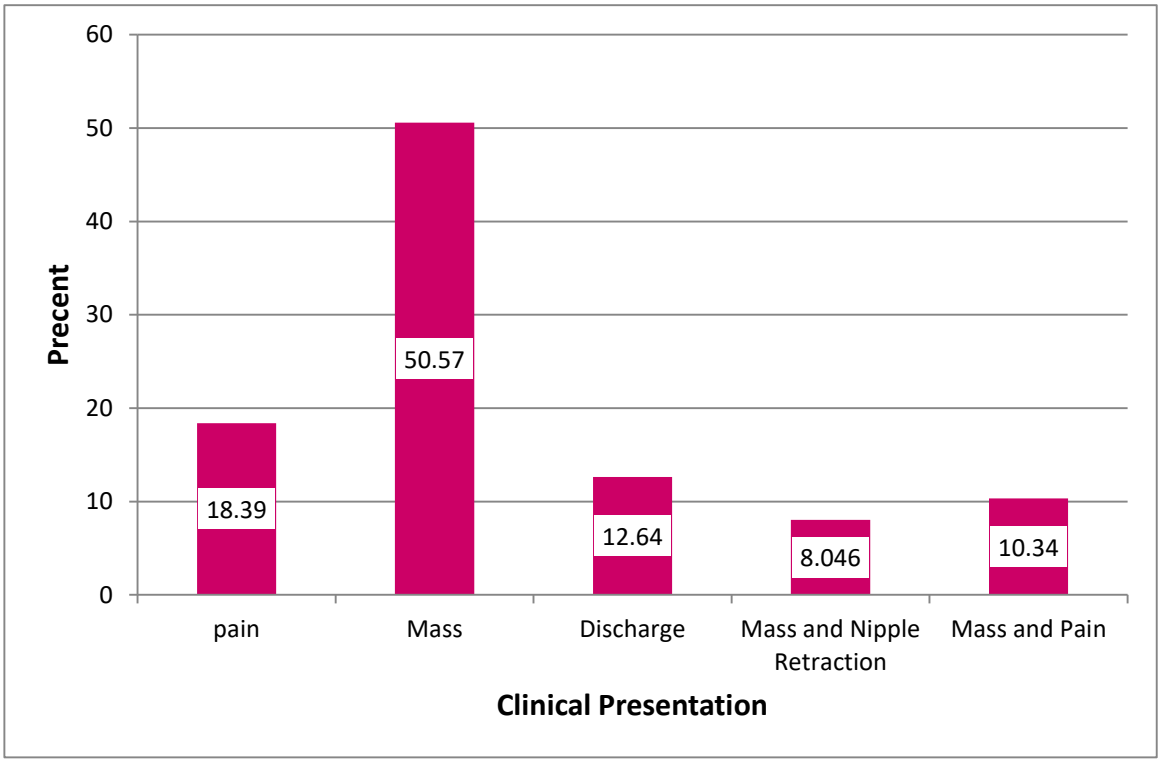

Figure 5: Clinical presentation of breast masses

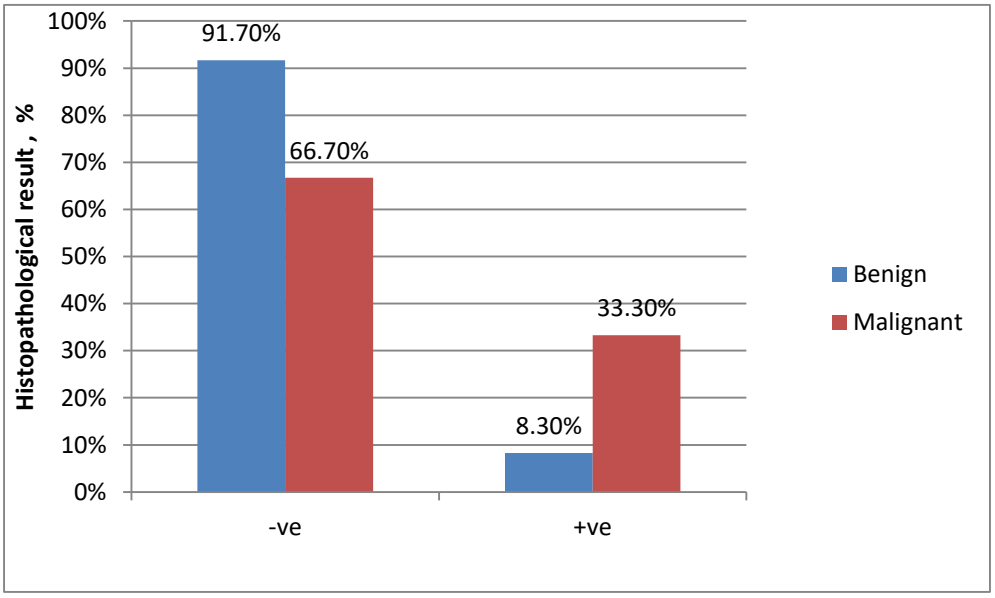

Figure 6: Family history of Breast Cancer and histopathological results (P – value: 0.003)

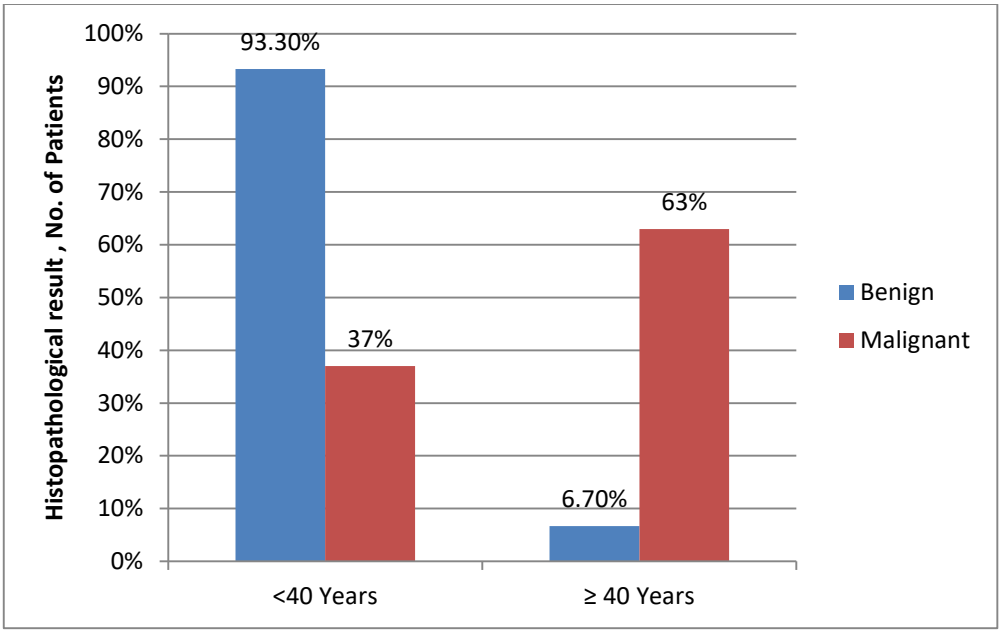

Figure 7: Age variation and Histopathological results (P-value 0.001)

Table (1): Sensitivity, specificity, PPV and NPV of US

U/S results	Histopathologicalresults		Total
	Malignant	Benign	
Malignant	27 (TP)	13 (FP)	40
Benign	0 (FN)	47 (TN)	47
Total	27	60	87

The data of Table (1) indicate that in this study ultrasound had 100% sensitivity and NPV. The specificity and PPV were 78.3% and 67.5% respectively. The accuracy rate was also high representing 85%.

Discussion

Ultrasound services have been widely introduced at relatively inexpensive cost compared to other investigation.[4]Therefore due to the accessibility of these ultrasound services, they form a vital role in evaluating palpable breast masses.

The highest incidence of breast lumps was relatively higher in women of reproductive ages (below 40 years old); most of the patients with a malignant breast mass were aged 40 years and older, This agrees with Hasni H. et al study.[9] Where findings are comparable to what Kailash et al [10] and Khanna et al [11]found out. This is also comparable to the findings reported by Smallwood et al.[12]

The validity of ultrasonography in our study (table1), confirms the sensitivity of ultrasound for breast cancer(identification of malignant lesions in patients with breast cancer; 100%). Of 27 malignant lesions, all correctly classified as malignant. This agrees with Hansi H. et al study.[13] In this study shows high Negative Predictive Value of the sonographic classification. The Negative Predictive Value for a sonographically benign classification was 100%. No lesion classified as benign were found to be malignant at biopsy, this agrees with study done by Hansi H. et al,[13] and agrees with a study done by P.SKaane et al.[14]The specificity of our result was 78.3%, and the Positive Predictive Value was (67.5%). In Stavros study the specificity was (67.8%) and the Positive Predictive Value was lower than ours (38%), because of larger number of sample size in Stavros study

In this study, the sonographic accuracy was (85%) in differentiating benign from malignant lesions was higher than the result of Stavros et al,[8] in which the accuracy was 72.9%.

This therefore means that sonography is a useful imaging modality in giving important clues about breast masses as either benign or malignant, thus could be used as initial investigation that could guide other subsequent investigations.

Form this study, it can also be concluded that benign masses were more readily diagnosed by ultrasound than malignant masses. Among the multiple ultrasonographic parameters, all were statistically significant ($P<0.001$) except maximum diameter of masses.

In this study, There was a significant statistical relationship between family history of breast cancer and histopathological results. One third of the participants with malignancy had a positive family history of breast cancer in comparison to only 8% of those with benign masses , this disagrees with Hasni H. et al study.[13]

In this study, 74.1% of the malignant breast masses have irregular shape and 41.7% of oval shape masses were benign, this agrees with Costantini M et al study,[15] and with Pande AR at al study.[16]

In this study, There was a significant association between margins of the mass and histopathological results. The smooth and macrolobulated margins were more often associated with benign masses.For spiculated margins, 90% were found to be malignant and 10% were benign this agrees with Costantini M et al study[15] in which the result were 87.5% and 12.5% respectively.

Regarding the margin definition; this study shows that 70.4% of the ill defined masses were malignant and benign pathology can be associated with ill defined margin in a small number while well defined contour is often associated with benign lesions , these findings agrees with AL-Dabbagh et al study.[17]

In this study 55.6% of the malignant masses show shadowing , this agrees with Costantini M et al study.[15]While most of benign masses show enhancement with edge shadowing pattern in the posterior echo.

In this study, There were no any statistically significant relationship between the size of masses and histopathological results i.e. the mean size of malignant tumors in mm did not differ statistically from that of benign masses, this agrees with Stavros et al study.[8]

In this study, 30% of our benign lesions were mild hypoechoic or isoechoic to fat, while 55.6% of malignant masses were markedly hypoechoic; therefore marked hypoechogenicity is a worrisome finding for malignancy and mild hypoechogenicity and isoechogenicity are not necessarily reassuring, and these findings agree with Stavros at el study.[8]

Conclusion

The sensitivity of ultrasound for detection of cystic masses is very high so it has a definite role in differentiation of cystic from solid masses of the breast. The sonographic evaluation of a simple cyst should eliminate the need for further invasive procedures including aspiration and biopsy.

This study shows that sonography is useful in characterization of some solid masses by good sonographic technique and strict adherence to the criteria for a benign lesion, which require the absence of even a single malignant finding. By using these few benign characteristics we found that the false negative nodules can be avoided.

Attention must be paid to combination of sonographic features rather than any single characteristic.

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Retained intra-abdominal post surgical gauze expelled with defecation :Case report

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Abstract:

Background: Retained surgical gauze is one of the serious complications after abdominal surgeries. It's underreported due to its medico-legal implications . **Presentation of case**: To our knowledge this is the first reported case in Iraq of gossipbioma left behind for 11 months after cesarean section .A 43-years-old lady presented with chronic lower abdominal pain admitted in medical ward for further work up. Plain abdominal X-ray revealed intra-abdominal foreign body and proved by CT scan to be retained surgical gauze inside the intestine which expelled through defecation after 2 days of imaging .She reported dramatic improvement and no surgical intervention needed and no more complaints felt after that event. **Conclusion:** Despite the intraoperative surgical gauze number registering , retained surgical sponge and other foreign bodies remain to happen every now and then but trans-mural migration is rare. Surgical intervention should be considered for removing it ,but in absence of acute complications e.g. intestinal obstruction, sepsis or gastrointestinal hemorrhage ,conservative management can be tried and become an option before embarking on surgical intervention.

Key words: Gossybioma ,retained surgical gauze, transmural migration.

Introduction:

Retained intra-abdominal surgical gauze is a condition reported sporadically . Gossybioma is another term applied for retained surgical gauze which compose of Gossypium mean cotton in Latin and boma means place of concealment in Kiswahili.[1] It is rarely reported due to its medico-legal implications .[2] The true incidence is largely unknown and different estimates have been reported which is ranging from 1:1000 to 1:5000 laparotomies.[3] It has negative effect on the patient's health as well as on the surgeon's professional reputation. Its clinical features are variable ranging from accidental postoperative finding of the gauze to abdominal pain ,sepsis, intestinal obstruction ,fistula formation.[4] One of the rare complications of gossiybioma is trans-mural migration into the ileum, stomach, colon, or bladder without any apparent opening in the wall of these hollow organs.[5]

Retained surgical gauze can be diagnosed preoperatively by radiological studies such as plain radiography as most surgical gauze has radiopaque markers but to identify transmural migration CT scan can be used to detect its exact location.[6] The aim of presenting this case is to highlight rarity of the transmural migration of retained surgical gauze and its spontaneous expulsion with defecation without any surgical intervention .

Case history :

A 43-years-old lady who had undergone emergency caesarean section in Maternity Hospital 11 months earlier. She has been admitted to the medical ward complaining of abdominal pain ,anorexia, abdominal distension but no constipation. The physical examination revealed tenderness on left side of umbilicus . Her cesarean section was complicated due to bleeding from the angles of the uterine incision. She had frequent gynecologic, medical and surgical consultations in the previous months for the colicky abdominal pain which was treated conservatively with analgesics and antispasmodic agents but with little temporary response .She reported an occasion of acute abdominal pain with fever , peri-umbulical swelling in first few weeks of postpartum period for which she was admitted and treated with intravenous antibiotics .During the duration of her illness several abdominal ultrasound scanning had been done during those consultations but no plain abdominal radiography had been taken. All hematologic and biochemical tests were normal apart from mild hypochromic microcytic anemia .In last admission, Plain radiograph of abdomen (Figure 1) ordered and revealed radiopaque foreign body about 5 cm in length in the center of abdomen .Ultrasound scanning of abdomen detected irregular thickening of loop of bowel with linear bright object found inside the lumen of bowel with mild dilatation of the abnormal bowel loop proximal to the object. In Double contrast CT scan of abdomen a hyper dense intraluminal shadow seen in central bowel loop with mild dilatation (Figure 2) . Unexpectedly , next day the patient expelled painfully a big surgical sponge 40*40cm with defecation (Figure 3) . She reported dramatic relieve of abdominal pain and had taken for the first time very good breakfast that she had not in the past 11 months. No medico-legal claim has been filed.

Figure 1 : Plain abdominal radiograph shows radiopaque shadow in the center of abdomen

Figure 2 (A,B and C) : Contrast enhanced abdominal CT scan reveals transmural migration of the gauze into the small intestine (white arrow)

Figure 3: photograph shows expelled surgical gauze

Discussion:

Retained surgical gauze is serious problem facing patients and surgeons. The risk factors are emergency ,gynecologic ,general surgery operations, obesity ,changes in treatment team ,excessive blood loss in trauma patients, unplanned procedural changes and failure to count surgical sponges .[7] , [8] clinical presentation of retained gauze is variable ranging from asymptomatic silent foreign body granuloma for years to inflammatory exudative intra abdominal mass .[8] Some patients reaching to 6% may remain asymptomatic and may never be discovered .[3] The exudative mass may cause abscess or eroding the adjacent viscera causing fistula or perforation. Trans-mural migration of the exudative intra-abdominal gauze to the intestine is one of the possibilities and the small intestine is the most common part of the intestine into which migration takes place because of large outer surface area and thin wall offering least resistance.[9] Wattanasirichaigoon describes 4 stages in the

process of migration: foreign body reaction, secondary infection, mass formation, and remodeling .[8] , [9] After migration of the retained gauze to the intestine it might cause intestinal obstruction or haemorrhage .[10] Its expected after migration of the retained gauze it will be impacted in the distal ileum but in the current case it was spontaneously expelled with defecation only after 2 days of contrast imaging. Our explanation is the contrast which used was gastrograffin which is probably due to its osmotic effect may facilitate its expulsion through rectum .To our knowledge this is fourth reported case of retained surgical gauze expelled spontaneously through the rectum.

Most retained gauze has radiopaque marker that make it visible on plain x ray, which was the key of diagnosis of the current case, but the CT scan prove its intraluminal location.

Conclusion:

In conclusion, any patient with postoperative abdominal pain for long duration ,responding partially for treatment ,should have plain radiography of abdomen to exclude retained objects, which is simple and not costly. It will guide us for further costly and complicated investigations ,if needed.

Its recommended that accurate sponge counting is mandatory and the surgeon can proceed to closure of abdomen after ensuring correct number of gauze by the scrub nurse and systematic wound/body cavity examination. Its also advisable to use only sponge with radiopaque markers specially in abdominal surgeries . Lastly, conservative management can be an option of treatment in retained intraluminal gauze with no major complications e.g. intestinal obstruction, sepsis and hemorrhage .Recently using electronic markers are the most sensitive and specific tool to avoid missing sponge after operation .

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Nutritional Assessment of Primary School Students in Essian Camp

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Abstract

Background and objective: Nutrition has the main field for health promotion of school -age children it is crucial that the increasing energy requirements forthcoming with this age group be meet daily with foods of high nutritional value. The study was conducted to evaluate the nutritional status of students in Essian primary school.

Methods: All students in grades (4-6) in Essian primary school in in Essian Internally Displaced Person camp enrolled in this study. The nutritional status assessed through measuring of anthropometric measurements (weight, height, Mid Upper Arm Circumference and Bilateral pitting edema). Information on the foods that consumed by each student in last 24 hours was obtained by a specially constructed questionnaire. Data analysis was done by using WHO anthro plus software program and SPSS version23.

Results: 253 students are screened, their age ranged (10-15 years), 161 males and 92 females . Mean students age 12.05 years. Prevalence of stunting 25.69% {20.55% moderate stunting (<-2 z-score ≥-3 z-score) and 5.14% severe stunting (< -3Zscore)}. Prevalence of overweight 11.46 % {8.70% overweight (>1z-score and ≤ 2 z-score) and 2.77% obesity (>2 z-score) } . Prevalence of thinness 5.93% {5.14% moderate thinness (<-2 z-score ≥-3 z-score) and 0.79 % severe thinness (<-3Z score)}. The mean individual dietary diversity score was 9.1.Up to 59.3% of students had a history of Acute Respiratory Tract Infections and 15.4% had a history of diarrhoea within two weeks prior to the study.

Conclusions: The prevalence rate of stunting and thinness among the primary school children in Essian camp is higher than national level while the prevalence rate of overweight/ obesity is lower. Local authorities to overcome causes of malnutrition should adopt a well-constructed program for all forms of malnutrition and treat the existing cases.

Keywords: Nutritional assessment; schoolchildren; Essian camp.

Introduction

Adolescence is one of the most accelerated stages of human growth and development. Many factors will effect this growth and development like internal factors (e.g. gender) and external factors (e.g. over or under -nutrition, abusive environment, security instability, wars). These factors can result in different adverse health sequelae, growth retardation or obesity and scholastic backwardness [1].

In emergencies, weight loss among under-five year's children is usually taken as a proxy indicator for the general health and well-being of the whole community. The scientists assumed that under five years children are more sensitive than other population groups to extrinsic factors (such as food deficiency and diseases) and the nutrition status of these children is more sensitive to change than that of adults in many populations [2]. Although the prevalence of malnutrition in the under-five age group is critical. In 2002 the United Nation's Standing Committee on Nutrition launched to encourage research and interventions into the malnutrition of school-age children, on account of this age groups potential to experience "catch up" growth. For example, school-age children who were underweight early in childhood period can grow to have a normal weight for age if their nutritional status and environment improves [3] . Internal and external conflicts have changed in complexity and nature over the last decades. Children and adolescence became direct victims in many places globally. Conflict affects children's health in four essential manners. First, conflict Compelling many people to displace either in their countries or across borders to other countries, which increases child death and injury, mainly through increased susceptibility to infectious disease from lacking essential health services including immunization and unsanitary living conditions. A case study on Southern Sudan illustrates that conflict reduces sanitation, clean water, and health services. Second, children have a higher risk of food insecurity and shortage, which may increase the prevalence of malnutrition during times of conflict. The country case of Chad illustrates that food insecurity is heightened by the resettlement of displaced people leading to higher rates of malnutrition. Third, adolescence, especially girls, are subjected to an increased risk of sexual abuse from armed fighters during the strife. Fourth, conflict induces long-term physical and psychological disability in children [4].

In 2014, the continuous escalation of the armed conflict in the Iraq has triggered the displacement of thousands of Iraqis across the Country .From the beginning of January through December 2014, the Displacement Tracking Matrix (DTM) identified 2,123,340 Internally Displaced Persons (IDPs) dispersed across 2,092 distinct locations in Iraq. The highest number of IDPs originated from Ninawa province with 996,828 individuals (47%), followed by Anbar with 576,774 individuals (27%), and Salah al-Din with 265,266 individuals (12%). Up to 45.8 % of total IDPs settled in Kurdistan Region, about 641,022 of them distributed throughout Duhok province districts. At the

initial stage of displacement, the IDPs settled in any place that could be dwell like schools, unfinished buildings, temporary camps, community canters, rented houses etc. About 199,000 of IDPs settled in 18 newly build camps throughout the Duhok province.[5,6] There is a comparative deficient of available published information regarding the nutritional status of school attending children, especially who are living in camps. Taking into account this, the study objective ‘s was to assess the nutritional status of primary school children living in an IDP camp.

Subjects and Methods

The study conducted in Essian Primary school in Essian IDP camp, which is located east of Baadre town in Shekhan district. The total population of the camp at the time of the study was (14809), percentages of 6-11years and 12-17 years compared to total population are 17% and 20 %.Percentages of children who attend schools of these two subgroups are 78%and 66% respectively [7]. To achieve our objectives a cross-sectional design chosen. Inclusion criteria were all available students in grades (4-6) regardless of their ages. The students in grades (1-3) excluded because the researcher thought that they might not be able to answers accurately all questions in the questionnaire especially that related to items of food that they consumed daily. Information was gathered by direct interview with students in the classes through a structured questionnaire, after self-introduction by the researcher to the student.

Dietary diversity, defined as the number of different food groups consumed over a given period of time, provides information on household food security. While the individual dietary diversity score (IDDS) is used as a proxy measure of the nutritional quality of an individual’s diet, the household dietary diversity score (HDDS) is used as a proxy measure of the socio-economic level of the household when to collect the data. To accurately capture changes in HDDS over time, data should be collected during the period of greatest food shortages (such as immediately prior to the harvest). Information on household or individual food consumption should be collected using the previous 24 hours as a reference period (24-hour recall). Longer reference periods result in less accurate information due to imperfect recall. When using the 24-hour recall method, the interviewer should first determine whether the previous 24-hour period was "usual" or "normal" for the household or individual.[8] In this survey, a 24-hour recall period was used to estimate the frequency of the consumption of 11 food groups. Students were asked how many times they had eaten foods from each food group during the last 24 hour. Anthropometric measurements done through four steps: First by examining presence of bilateral feet pitting oedema . Second by measuring weight by using an electronic scale (Uniscale-Secca 874)- Mobile flat scales for mobile use with push buttons and

double display The double display lets the patient and medical personnel read the results from two different prospects at the same time. Third by measuring Height by using special device Adult Height Measuring Device (Microtoise) {UNICEF Height measuring instrument (0-2 m)}. Fourth by measuring Mid Upper Arm Circumference (MUAC) by using special tape adopted by United Nations Children's Fund (UNICEF). MUAC was used as a proxy of thinness. It is also known as a good predictor of acutely malnourished children. Nutritional status was classified as normal, moderate or severe based on World Health Organization (WHO) cut-off point for age 10-14 years [9].

Data were analysed by using the Statistical Package for Social Sciences (SPSS, version 23) and WHO AnthroPlus software is a program for the global application of the WHO Reference 2007 for 5-19 years to monitor the growth of school-age children and adolescents. [10]

WHO classification of nutrition conditions in adolescence based on anthropometric measurements and applying of WHO (2006) growth charts as follow: [11] Overweight : > + 1SD , Obesity : > +2SD , Thinness : < -2SD , Severe thinness : < -3SD. Stunting : < -2SD , Severe stunting : < -3SD.

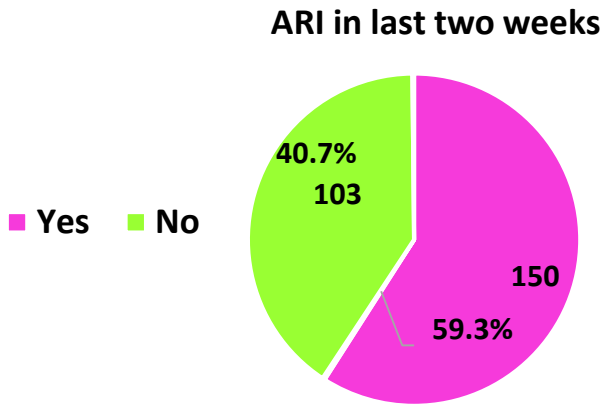
Results: A total of 253 students (161 male and 92 females) are studied. Their age ranged from 10-15 years. Students of age 12 years represents the highest percentages 29.6% followed by age 13 (18.6%) and the least of age 15 95.5%). As shown in Table.1.

Table1: Demographic Characteristics of Study Sample.

Students' age in years	Male		Female		Total	
	No.	%	No.	%	No.	%
10	27	16.8	18	19.6	45	17.8
11	22	13.7	21	22.8	43	17
12	51	31.7	24	26.1	75	29.6
13	30	18.6	17	18.5	47	18.6
14	19	11.8	10	10.9	29	11.5
15	12	7.5	2	2.2	14	5.5
Total	161	100	92	100	253	100

The study showed that up to 59.3% (150) of students had history of an attack of acute respiratory tract infection (ARI) while only 15.4% (39) had history of diarrhoea during last two weeks prior to the study as shown in Figures1 &2.

Figure 1: Number of cases of ARI during last two weeks



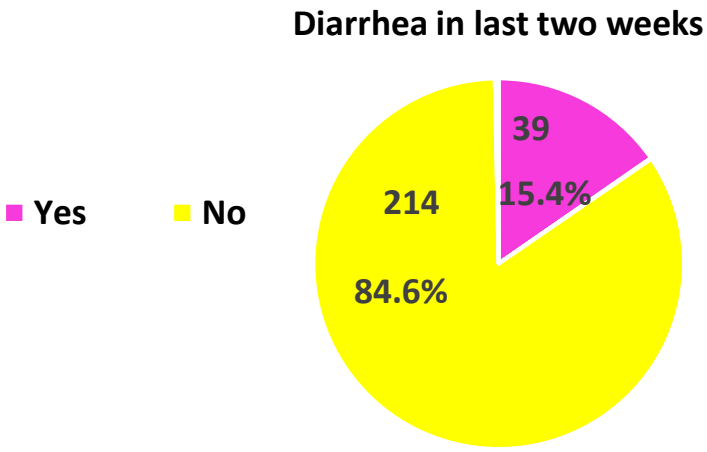


Figure 2: Number of diarrhoeal cases among studied students during last two weeks.

The study revealed that 25.69% of studied sample had stunting [20.95% of moderate type (<-2 z-score) and ≥-3 z-score , and 4.74% of severe type (<-3 z-score)].Prevalence of stunting is slightly higher among males (26.06%) than females (25.00%) Table 2.

Table 2: Prevalence of stunting based on height-for-age Z-scores and by sex.

	All students	**Male (161)**	**Female (92)**
Prevalence of Stunting (< -2Z score) No. (%)	65(25.69)	42(26.06)	23 (25.00)
Prevalence of Moderate stunting (<-2 z-score and ≥-3 z-score) No. (%)	53(20.95)	33(20.50)	20(21.74)
Prevalence of Severe stunting (<-3 z-score) No. (%)	12(4.74)	9(5.59)	3(3.26)

Prevalence of thinness based on Body Mass Index (BMI) for age was 5.93% for all types of thinness [5.14% moderate thinness (<-2 z-score and ≥-3 z-score), and 0.79% severe thinness (<-3 z-score)]. Thinness is more among males (6.83%) than females (4.35%) Table 3.

Table 3: Prevalence of thinness based on BMI-for-age Z-scores and by sex.

	All students	**Male (161)**	**Female (92)**
Prevalence of Thinness (< -2Z score) No. (%)	15(5.93)	11(6.83)	4(4.35)
Prevalence of Moderate Thinness (<-2 z-score and ≥-3 z-score) No. (%)	13(5.14)	9(5.59)	4(4.35)
Prevalence of Severe Thinness (<-3 z-score) No. (%)	2(0.79)	2(1.24)	0(0.00)

Overall, the prevalence of thinness (≤ 185 mm) based on MUAC measurements is (25.69%) among which (22.53%) had moderate thinness (160-185mm) and (3.16%) severely thinness (< 165 mm). Males (27.95) are more affected by thinness than females (21.74) Table 4.

Table 4: Prevalence of Acute Malnutrition based on MUAC for-age and by sex.

	All students	**Male (161)**	**Female (92)**
Prevalence of Thinness (≤185mm) No. (%)	65(25.69)	45(27.95)	20(21.74)
Prevalence of Moderate Thinness (160=185mm) No. (%)	57(22.53)	39(24.22)	18(19.57)
Prevalence of Severe Thinness (<160mm) No. (%)	8(3.16)	6(3.73)	2(2.17)

Table.5 shows that (11.46%) of studied sample had overweight in all forms (>1 Z score) [8.70% moderate type of overweight (>1 z-score and≤2 z-score) , 2.77% obesity (>2 Z score)]. Males(13.04%) are more affected by overweight than females(8.70%) .

Table 5: Prevalence of overweight and obesity based on BMI-for-age Z- scores and by sex.

	All students	**Male (161)**	**Female (92)**
Prevalence of all forms Overweight (>1Z score) No.(%)	29(11.46)	21(13.04)	8(8.70)
Prevalence of Moderate overweight (>1 z-score and≤2 z-score) No.(%)	22(8.70)	16(9.94)	6(6.52)
Prevalence of Severe overweight (obesity) (>2 z-score) No. (%)	7(2.77)	5(3.11)	2(2.17)

No cases of bilateral pitting oedema among students was reported in this study.

In this study, a 24-hour recall period was used to estimate the frequency of the consumption of 11 food groups. About all the sampled student consume eggs and sweet (100.0%),cereals (96.84%) , vegetables (94.86%) , Fruits (94.47%) , cooking oil/fats (97.2%) , meat , chicken and fish 219 (86.56%),Milk and dairy products 191 (75.49%) , white tubers and roots152(60.08%) , pulses 139 (54.94 %) and spices131 (51.78%) Table 6. The mean IDDS for this study was 9.1 out of a possible 11.

Table 6: Type of food groups that consumed by students in last 24 -hour.

Food item	Students consumed No. (%)	Food item	Students consumed No. (%)
Cereals	245 (96.84)	Vegetables	240 (94.86)
White tubers and roots	152(60.08)	Fruits	239 (94.47)
Meat , chicken and fish	219 (86.56)	Pulses	139 (54.94)
Cooking oil/Fats	230 (90.91)	Sweets	253 (100.00)
Milk and dairy products	191 (75.49)	Eggs	253 (100.00)
Spices and condiments	131 (51.78)		

Discussion

In this study, a high prevalence of stunting observed, (25.69%) of the studied sample are suffering from stunting including (4.74% of them had severe stunting). Stunting is reflected chronic malnutrition and is usually resulted from long-term nutritional deprivation. Stunting often leads to delayed mental development, poor school performance and reduced intellectual capacity.[12], which, is much higher than that found during National Micronutrient deficiencies: Assessment and Response (MNAR) survey which was done in Iraq in 2012; stunting prevalence was 8.9% [13]. Another study conducted in 2011 for the students of 25 primary schools in three Iraqi provinces (Sulimaniyah, Thi-Qar, and Salahaldin), the study results revealed that about 14% of the students were suffering from stunting [14]. The high prevalence of stunting may be due to the poor socioeconomic status of most of Essian camp population and, where they are originated from Sinjar area. According to Comprehensive Food Security and Vulnerability Analysis-CFSVA study done by World Food Program (WFP) in Iraq (2007), Sinjar district was one of 17 districts in Iraq classified as Cluster four "extremely vulnerable" area. This cluster characterized by the highest rates of food insecurity and poverty. [15] In this study ,males are slightly affected by stunting more than females, while MNAR survey appeared that female students more affected (10.5%) than male students (7.6%) .[13] In 2016, a Nutritional survey among IDPs in Duhok province revealed that 15% of (6-59 months) aged children had stunting, which is higher than that found among IDPs in Erbil province 11.6% and in Sulaymaniah province 9.5% .[16] Hasan et al found that prevalence of stunting among school age children inn Azad Nagar and its surrounding areas of Bangalore was 40.4%. Which may be due to poor dietary habits and ignorance of balance diets among students and their parents[17].

The study also showed that (5.93%) of students had thinness based on BMI for age Z score measurements, only (0.79%) had severe thinness. In MNAR survey and the study that conducted in three Iraqi provinces showed slightly fewer percentages of thinness and severe thinness (2.9%, 3%), respectively[13, 14]. In spite of thinness, usually, reflect acute malnutrition conditions, and known to be associated with infections like diarrhoea or sudden food shortage. The thinness percentage is below

the emergency threshold as defined by the World Health Organisation. [12] The prevalence of wasting among (6-59 months) aged children of IDPs was very low (1.8%) which may be due to adequate food supplies and security at the time of the study. Although, the humanitarian situation in Iraq cannot be predicted and the possible escalation of food insecurity at any time.[16]. MUAC measurements showed the higher prevalence of thinness (22.53%) if it compared with that percentage detected by BMI for age Z score measurements (5.93%).This may be due to MUAC measurement is more sensitive than BMI for age measurement for detecting cases of undernutrition. Abrhame and Haidar did a large study among adults and they found that 35% of females and 48% of males have thinness based on MUAC, on another hand 29% female and 32% males had thinness based on BMI for age.[18]. Mramba team did two cohort studies among children and adolescents, they that

MUAC classified a larger number of children and adolescents as being severely undernourished (thinness) than did BMI, which may have interventional implications, although, MUAC a higher sensitivity for detecting mortality risks associated with malnutrition. [19] Although MUAC is the keystone of nutritional assessment in other age groups, there no any internationally accepted reference or cut off points for MUAC prevail for school-age children and adolescents.[19,20]

In addition to undernutrition cases, the present study found about (11.46%) of the studied sample are overweight including (2.77% obesity).This lower than the national level that recorded in MNAR survey, which found that 18.6% of students had overweight with 6% of them are obese.13 The incidence of overweight/ obesity rapidly increased worldwide among all age groups, in 2016, WHO estimated that more than 1.9 billion persons (18 years and older) , were overweight and Up to 340 million children and juvenile aged 5-19 were overweight or obese. [21]

The mean IDDS for this Study was 9.1 out of potential (11), which indicate that on average a student in this study consumed nine food groups out of 11 food groups in last 24 hour. This reflects a good quality score, represents fair food consumption in the population and it means that food security at the acceptable level. This score is near to mean HHDS (10.6) that was calculated in last nutritional survey among IDPs in Duhok province in 2016.[16]

Conclusion: The prevalence rate of stunting and thinness among the primary school children in Essian camp is higher than national level while the prevalence rate of overweight/ obesity is lower. Local authorities to overcome causes of malnutrition should adopt a well-constructed program for all forms of malnutrition and treat the existing cases. It is important to invest in preventive interventions so that no gap in knowledge, practice or action paves way for any level of child malnutrition.

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Health status of children under five years old in Syrian refugee camps in Erbil City / Kurdistan Region /Iraq

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Abstract

Background And Objectives: Children have rights to live in a best health status. The war in Syria has caused many health problems in the 21st century. Depending on United Nations Refugee agency data, about 2.5 million people have entered other countries as Turkey, Egypt, Lebanon, Jordan and Iraq. The objective of this study was to assess the health status of children under five years old in Syrian camps in Erbil City.

Methods: Cross-sectional, descriptive design has been conducted to assess health status of children under five years in Syrian camps in Erbil city. The data were collected from the period of 15/5/2016 to 15/8/2016. So that the 363 children were chosen randomly among children under five years old. The standard questionnaire was designed and used for data collection in Qoshtapa and Darashakran camps in Erbil city. The questionnaire contained six parts. Part one related to demographic characteristics, and the other five parts related to assessment of different health problems of children in the camps. The permission was taken from the scientific committee of the college of nursing, parents of children, general Directorate of Erbil Asaish, and the management of the camps. .

RESULTS: The study revealed the following health conditions among children as: Dirty skin (44.9%), redness of the eye (36.6%), dandruff (44.4%), runny nose (56.5%), vaccinations coverage (99.7%), anemia (27%), diabetes (0%), urinary tract infections (UTI) (17.6%), and lesions of eyelids (1.4%). The study revealed that there was no significant association between respiratory signs, symptoms and age, neurological signs and symptoms and vaccination coverage with age.

CONCLUSION: The study revealed that there were many health problems among children as (dirty skin, dandruff, eye problems, running nose, anemia, and UTI and there was no association between respiratory symptoms, neurological symptoms, vaccination coverage and their age groups.

KEY WORDS: Health status, Refugees, Camps, health problems. Health status

Introduction:

The war in Syria has caused many health problems in the 21st century. Depending on United Nations Refugee Agency data, about 2.5 million people have entered neighboring countries, and these are Turkey, Egypt, Lebanon, Jordan and Iraq. The United Nations Refugee Agency has recorded about 9,503 Syrians at the end of July 2012, who have left Syria for political, economic and social causes. In February 2013, the number had increased over 10-folds to 102,447 [1]. By February 2014, the figure stood at 225,548 [2] and continues to increase. As of 5th of March 2014, 226,934 people had been reported as refugees in Iraq. The majority of them (around 97%) were recorded in the Kurdistan Region in Northern Iraq, in and around the cities of Duhok (109,979 refugees), Erbil (84,881 refugees) and Suleimaniyah (25,134) [3]. Around 60% of Syrian refugees are hosted within communities across Kurdistan and the remaining 40% live in refugee camps (UNHCR, 2014a). When Syrian refugees first began arriving in 2012, most were registered in the Directorate of Duhok, near the Peshkhabour near Syria. This cause to the open Domiz camp on 01 April 2012. It is considered as the largest camp with a population of 58,500, as of 28 February 2014. In 2013, as the number of refugees has increased, other permanent camps were opened in the Directorate of Erbil: Kawergosk (15 August 2013), Qushtapa (19 August 2013), Basirma (26 August 2013) and Darashakran (29 Sept 2013), with a combined population of 28,208, as of 28th February 2014 [4] More than 5.5 million Syrian children see their future is limited by war [5]. Children have rights to live healthy. [6] The disabled Children have right to special care and best education. The expanded program of child care may help to decrease child mortality and morbidity especially decreasing health problems like vomiting, diarrhea and acute respiratory tract infections (ARI) which need urgent intervention and medical attention. [7] If there is no best health conditions of living for children so many health problems may occur among them so about 70% of child deaths in Cambodia are related to diarrhea, pneumonia and neonatal conditions. Depending on World Health organization (1948), healthy growth and development of the children is very important [8]. According to WHO malnutrition was the direct cause of deaths among under five years children so that nearly 49% of them in developing countries [9].

Methods:

A cross-sectional descriptive design was conducted to assess the health status of children under 5 years in Syrian camps in Erbil city. The study was conducted in Qoshtapa and Darashakran camps in Erbil. The population of Qoshtapa camp was 6,710 refugees, and it is located in Qushtapa, Erbil. The original areas of the refugees were from Qamishly, Diralok and Hasaka of Syria. It was opened on 19.8.2013. Camp population of Darashakran was 10,082 refugees. It is located in Khabat, Erbil. Areas of origin of the refugees were mainly Qamishly and Aleppo in Syria. It was opened on 29.9.2013. Permissions had been taken from the ethics committee of the nursing college, parents of children who participated in the study, General Directorate of Erbil Asaish, and General Directorate of health during April, 2016. The sample size of children was 363 chosen randomly out of 6732 children under five years old. Children under 5 years old, of both genders were included in the study but, parents who refused to participate and some children who has chronic illness like congenital malformation had been excluded from the study. A standard questionnaire was developed and prepared after reviewing by 25 experts in nursing and medical fields containing seven parts as follows: part one Socio demographic data: This part is concerned with socio demographic characteristics of children which include items such as age and sex. Part two: personal hygiene: This part is concerned with skin hygiene, scalp dandruff, hair cleanliness. [12]. Part three: anthropometric measurements this part concerned with measurement of body height, weight to find out the cases of underweight, stunting, wasting, by using WHO schedule growth standard [13] Part four: Physical assessment this part is concerned with physical assessment for eye redness, eye discharge, [14] common cold, allergic rhinitis, and pulse rate regularity [15]. Part Five: laboratory investigations for anemia. [16] Part Six: Disability types and causes of disability. This part was concerned with mobility problems, psychological difficulties, difficulty with self-care and hearing difficulty 17. Part seven: Vaccinations coverage, included checking the vaccination card of the children which consist of full vaccination, partial vaccination and non-vaccinated. Data were prepared, organized and entered into the computer. The statistical package for social sciences (SPSS, version 19) for windows was used to analyze the data categorical variable was described through frequency and percentages. [18].

Results:

Table 1 shows that the majority of the study sample were males which represent 59.8%. While the female group represent 40.2%, and majority of the study sample was Kurdish which represent 99.4%. While the Arabic Ethnic group represent 0.6%.

Table 1: Distributions of the sample by their age in month, gender, and nationality

	Frequency	Percentage (%)
Age in months		
< 6	81	(22.3)
6-12	77	(21.2)
13-36	112	(30.9)
37-60	93	(25.6)
Gender		
Male	217	(59.8)
Female	146	(40.2)
Nationality		
Kurdish	361	(99.4)
Arabic	2	(0.6)
Total	**363**	**100**

Concerning educational level of the father, table 2 shows that the highest proportion (40.2%) of fathers were illiterate.

Table 2: Educational level of fathers.

Level of education of father	Frequency	Percentage (%)
Illiterate	146	(40.2)
Read and write	17	(4.7)
Primary	101	(27.8)
Secondary	76	(20.9)
Institute	10	(2.8)
College	13	(3.6)
Total	**363**	**100**

Table 3 shows that 33.6% of the mothers were illiterate, and 25.9% were graduates of secondary schools.

Table 3: Distributions of children by the mothers' educational level.

Level of education of Mother	Frequency	Percentage (%)
Illiterate	122	(33.6)
Read and write	33	(9.1)
Primary	83	(22.9)
Secondary	94	(25.9)
Institute	11	(3)
College	20	(5.5)
Total	**363**	**100**

Table 4 shows that the majority (55.1%) of the study sample had clean skin, and 44.9% of children had dirty skin.

Table 4: Distributions of children by skin hygiene.

Skin hygiene	Frequency	Percentage (%)
Clean	200	55.1
Dirty	163	44.9
Total	**363**	**100**

Table 5 shows that 55.6% of the study sample had no dandruff, and 44.4% had dandruff.

Table 5: Distributions of children by scalp dandruff

Dandruff	Frequency	Percentage (%)
Yes	161	(44.4)
No	202	(55.6)
Total	**363**	**100**

Table 6 shows that the majority of study sample were with clean and cut nails, which represent 55.1%.

Table 6: Distributions of children by Nails cleaning and cutting.

Nails clean and cut	Frequency	Percentage (%)
Yes	200	(55.1)
No	163	(44.9)
Total	**363**	**100**

Table 7 shows that the majority of the study sample were with running nose which represent 56.5%.

Table 7: Prevalence of runny nose among the studied sample.

Running nose	Frequency	Percentage (%)
Yes	205	(56.5)
No	158	(43.5)
Total	**363**	**100**

Table 8 shows the majority of the study sample were wearing hygienic clothes which represents 68%.

Table 8: Hygienic clothes among the study sample.

Clothes hygiene	Frequency	Percentage %
Yes	247	(68)
No	116	(32)
Total	**363**	**100**

Table 9 shows that around half (47.4%) of the children take a daily bath, and 46.8% take a bath twice weekly.

Table 9: Bathing frequency among the studied sample.

Bathing frequency	Frequency	Percentage (%)
Daily	172	(47.4)
Once a week	21	(5.8)
Twice a week	170	(46.8)
Twice or more /Monthly	0	(0)
Total	**363**	**100**

Table 10 shows that more than one third (36.6%) of the children had redness of the eye, and 33.3% had eye discharge.

Table 10: Eye problems among the studied sample.

Eye condition	Frequency	Percentage (%)
Eye redness	133	(36.6)
Eye discharge	121	(33.3)
lesion on eye lids	5	(1.4)
normal	104	(28.7)
Squint	0	(0)
Total	**363**	**100**

Table 11 shows that 27% of children had anemia, and 17.6% had Urinary Tract Infection (UTI).

Table 11: Laboratory results of the studied sample.

Laboratory investigation results	Frequency	Percentage (%)
Anemia	98	(27)
Urinary tract infection (UTI)	64	(17.6)
Normal	201	(55.4)
Diabetes mellitus	0	(0)
Total	**363**	**100**

Table 12 shows that almost all (99.7%) of the children were fully vaccinated.

Table 12: Vaccination coverage among the studied sample.

Vaccinations coverage	F	(%)
Full	362	(99.7)
Partial	1	(0.3)
Not vaccinated	0	(0.0)
Total	**363**	**100**

Findings of the study showed that there was no significant association between respiratory system signs and symptoms among children and their age group such as cough (P- value =0.485), sputum (P-value=0.379), wheeze (P-value=0.185), hemoptysis (P- value =0.212), shortness of breathing (P- value =0.860), and cyanosis (P- value =0.212).This finding shown in table 13.

Table 13: Association between respiratory system signs and symptoms among children and their age group.

Age group		**0-5**		**6-12**		**13-36**		**37-60**		**P-value**
Respiratory										**Fisher's**
System		**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**Exact Test**
Cough	No	40	11	46	12.7	55	15.2	49	13.5	**0.485**
	Yes	41	11.3	31	8.5	57	15.7	44	12.1	
Sputum	No	51	14.0	52	14.3	63	17.4	61	16.8	**0.379**
	Yes	30	8.3	25	6.9	49	13.5	32	8.8	
Wheeze	No	64	17.6	64	17.6	79	21.8	74	20.4	**0.185**
	Yes	17	4.7	13	3.6	33	9.1	19	5.2	
Hemoptysis	No	81	22.3	77	21.2	110	30.3	93	25.6	**0.212**
	Yes	0	0	0	0	2	0.6	0	0	
Shortness of	No	80	22.0	75	20.7	109	30	90	24.8	**0.860**
breathing	Yes	1	0.3	2	0.6	3	0.8	3	0.8	
Cyanosis	No	81	22.3	77	21.2	110	30.3	93	25.6	**0.212**
	Yes	0	0	0	0	2	0.6	0	0	

Findings of the study showed that there was no significant association between neurological system signs and symptoms among children and their age group such as seizures (P- value =0.422), and paralysis (P-value=603). This finding shown in
Table 14.

Table 14: Association between neurological system signs and symptoms among children and their age group

Age group		**0-5**		**6-12**		**13-36**		**37-60**		**P-value**
										Fisher's
Neurological										**Exact Test**
System		**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	
Seizures	No	80	22	77	21.2	110	30.3	90	24.8	**0.422**
	Yes	1	0.3	0	0	2	0.6	3	0.8	**NS**
Paralysis	No	80	22	77	21.2	111	30.6	91	25.1	**0.603**
	Yes	1	0.3	0	0	1	0.3	2	0.6	**NS**

Findings of the study showed that there was no significant association between vaccination coverage and age groups (P- value =0.322) this finding shown in table 15.

Table 15: Association between vaccination coverage of children and their age group

Age group	**0-5**		**6-12**		**13-36**		**37-60**		**P-value**
Vaccinations									**Fisher's**
Coverage	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**Exact Test**
Full	80	22	77	21.2	112	30.9	93	25.6	
Partial	1	0.3	0	0	0	0	0	0	**0.322**
Not vaccinated	0	0	0	0	0	0	0	0	

Discussion:

The highest proportion of children were in the age group 13-36 months which represented 30.9%. Majority of the study sample were males which represent 59.8%. The highest ethnic group of children were Kurdish which represented (99.4%).This findings agree with report of Iraq Inter Agency Update Syrian Refugees Sept. 2015 that says that most of Syrian refugee in Kurdistan was Kurdish people [19] .Concerning educational level of father reflected that the majority of them were illiterate which represented 40.2%. Syrian people is poor people, most of them did not get the chance of education in Syria because of poverty and cultural values. Disagree with research which was done in Oru-Ijebu, Southwest Nigeria in 2012 which showed that majority of refugees were 52.3% secondary education [20] . Majority of mother's education level was illiterate 33.6% while most of mother's occupation were housewives which represent 78.2%. This study disagrees with cross sectional study was done by Nguyen Ngoc Hien, Sin Kam in Nghean, Vietnam which showed that the majority of child's mother (67.7%) was skilled manual work farmer. [21] The most of sample was represented clean skin that represented 55.1% and the 44.9% of cases were dirty skin . This result agreed with cross sectional study done by Amoran in sagamu in secondary school in Nigeria which showed the majority of cases were clean which represented 52% and 48% were dirty skin [22] .The majority of samples didn't have dandruff which represented 44.4%. This finding disagrees with a cross-sectional survey which was done by Shukla at Selected Orphanage in Salem, Chennai - India which state that majority of samples had dandruff which represented 78% [23] . [24] The majority of samples were with runny nose which represented 56.5%. Agree with study that was done by Yousif and Khaleq [25]. In Acute respiratory tract infection (ARI) are one of the most common causes of health problems with high morbidity and mortality among children under five years old. [25] In the current study the majority number of children presented with daily bathing which represented 47.4%. Agree with study done in Doiwala Block, Dehradun in India by Rakesh kakkar *et al*, (2012), who

found the majority of children were taking daily bathing which represented 78.4%. [26], [27]. More than one third of the sample had eye redness. Agree with study done by Lafta and Shamssain in Baghdad and Rumadi, Iraq.. A study done in Ethiopia showed that 3.5% of the sample had eye redness [28] .The children with anemia were represented 27%. Agree with a cross sectional study was done in Gaza Strip- Palestinian camps by El Kishaw *et al* who find the representation of children with anemia was 59.7% [29] . While the number of children with Urinary tract infection (UTI) were represented 17.6 %. Agree with study was done in Erbil City done by Alsamarai *et al* who found the representation in his study of urinary tract infection was 22% [30] . And 0% of children were represented with diabetes mellitus. Our study shows the children with diabetes multiuse were 0%. Agree with Iraq family health survey report in 2007 who found the presentation of children in Iraq with diabetes multiuse was 0.4% [31].

Conclusion:

The result of the study revealed that the percentage of health problems was as followings: Dirty skin (44.9%), scalp dandruff (44,4%), eye redness and discharge (36,6%), anemia (27%), urinary tract infection (17,6%), vaccinations coverage (99,7%). and runny nose was 56.5% . The study revealed that there was no significant association between respiratory signs and symptoms with their age, no significant association between neurological symptoms and age while there was no significant association between vaccination coverage and their age. The study recommended to decision makers of the Ministry of Health in Kurdistan Region/Iraq to develop effective disease prevention, health promotion, provide good health services and intervention programs for implementation in all camps in Erbil city.

Conflict of Interest:

The author reports no conflict of interest.

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Cololonoscopic findings in patients with bleeding per-rectum suspected of having bleeding internal hemorrhoids who are going to undergo hemorrhoid surgery or endoscopic band ligation.

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Abstract

Background and objectives: Rectal bleeding is a very common clinical sign. It is often caused by haemorrhoids. However, it can be a symptom of other pathology in the rectum or colon. In Kurdistan there are little data regarding coincidental or alternative pathologies in patients with haemorrhoids and rectal bleeding. The aim of study was to find alternative diagnosis in hematochezia suggestive of hemorrhoidal cause.

Methods: A Prospective follow up of 80 consecutive patients presenting with bleeding and haemorrhoids was done. All patients had colonoscopic examination. All significant colonoscopic findings (diverticuli, polyps, cancer, angiodysplasia, varices or colitis) were recorded.

Results: Out of total 80 cases of patients with bleeding per rectum and internal hemorrhoids referred to undergo total colonoscopy, 43.7% were turned out to have alternative findings. More than half of patients had normal colonoscopy (56%). The most common colonoscopic finding was Polyps 19%, cold snare polypectomy was done for most of them and sent for histopathological examination, two of them were large in size and suspicious so hot snare polypectomy done and sent for histopathological examination. Other colonoscopic findings were proctitis and colitis (12.5%), solitary rectal ulcer, colorectal carcinoma, ulcerative colitis, divericuli, and fissure in 2.5% of patients.

Conclusion: There are significant colonoscopic findings in patients presented with hematochesia suggestive of hemorrhoidal disease, some of them serious like polyps & cancer, while others may be incidental and not the cause of the hematochesia. These finding supports the recommendations that every patient presented with hematochesia suggestive of hemorrhoidal disease to be evaluated by colonoscopy to exclude other serious colonic diseases before conducting any therapeutic hemmorhoidal intervention.

Keywords:
Colonoscopy; Polyps; Hemorrhoidal Disease; Colorectal Cancer

Introduction:

Bleeding Per Rectum (BPR) or haematochezia is a common problem [1-10]. One in seven patients between 20 - 64 years have an attack of rectal bleeding requiring medical help [11-20]. It is a diagnostic challenge to distinguish between benign anal lesions & serious colorectal diseases [21-35].

Bleeding anal lesions especially hemorrhoids & fissures are frequent causes of rectal bleeding that could coexist with colorectal carcinoma, so proper evaluation including endoscopy is indicated in these cases [36-48]. The etiology of BPR is highly variable and depends on the nature of the population studied [49-60]. Common causes of BPR include: Hemorrhoids, Anal fissures, Polyps, Proctitis, Rectal ulcers, Inflammatory Bowel Disease (IBD), Colon ischemia & Cancer [61-72]. Hemorrhoids are laxity of the anal cushion (a collections of submucosal, fibrovascular & arteriovenous sinusoids that are part of the normal anorectum) leading to protrusion and prolapse of anal mucosa [73-75]. The exact prevalence of symptomatic hemorrhoids is very difficult to establish, as sufferers do not seek care for their problems or rely on over-the-counter remedies, while others attribute other anorectal symptoms as being the result of hemorrhoids [76-83]. Fifty percent of the population experience symptomatic hemorrhoid disease at some point in their lives [84-90]. The peak incidence of symptomatic disease is 45–65 years. Hemorrhoids before the age of 20 is unusual [91-10]. Risk is higher for whites than blacks [92]. Pregnancy is associated with an increased risk & there is slightly increased prevalence in women [94]. Chronic constipation & portal hypertension has not convincingly been linked to hemorrhoids [95].

Hemorrhoids are classified into external & internal in relation to their location proximal or distal to dentate line. Internals are covered by columnar epithelium while external ones are covered by squamous epithelium (anoderm). Mixed hemorrhoids are involving &bridging both [96-100].

The Grades of internal hemorrhoids include [100]: Grade I: Non-prolapsing internal hemorrhoids, Grade II: Internal hemorrhoids prolapse during defecation, spontaneously reduced, Grade III: Internal hemorrhoids prolapse during defecation, must be manually reduced, Grade IV: Internal hemorrhoids prolapsed & incarcerated.

The clinical evaluation of hemorrhoids vary with the extent of the disease process. Patients typically report haematochezia, itching, perianal discomfort, mucosal protrusions, soiling , or some combination of these symptoms[101]. The rectal bleeding typically occurs with or immediately after defecation. Substantial pain is rare in patients with uncomplicated internal or external hemorrhoids [102]. The presence of severe pain raises the possibility of other conditions, including anal fissure, perirectal or peri-vaginal infection, abscess & other inflammatory processes. Severe pain may occur

with complications of hemorrhoids (e.g., prolapse with incarceration & ischemia or thrombosis especially with external ones).[102].

The diagnosis is based on a precise patient history & careful clinical examination. Assessment should include DRE & anoscopy in the Left Lateral Position. Anoscopy is the most accurate method for examining the anal canal & the distal-most rectum. Anoscopy may be performed in the office on unprepared patients quickly, safely, with minimum patient discomfort [103]. Flexible endoscopy is much more frequently performed to evaluate a patient with anorectal issues but appears to be not as accurate as anoscopy [100]. Performing more extensive colorectal evaluation should be guided by the patient's age, presenting sign, /symptoms, duration & the nature of bleeding [100]. Evaluation of the entire colon is indicated for patients with any of the following: Anemia, Change in bowel patterns, personal history of rectal or colon polyps, family history of IBD, Colo-Rectal Cancer (CRC), or other hereditary colorectal cancer syndrome in a first-degree relative.[98]

The management of Hemorrhoidal Disease begins with c onservative medical management depending on degree &severity of symptoms and include dietary &lifestyle modification[90]. Office – based minimally-invasive procedures, the rubber band ligation being the safe & effective is most commonly tried before surgery, although recurrence rates are higher than with surgery [91].

Excisional surgery is most appropriate for patients who have grade IV disease, complications, or in whom non-operative treatment has failed.

Stapled hemorrhoidopexy, a newer technique for the treatment of patients with grade III or IV internal disease [94].

Patients And Methods

A prospective case-series study was carried out at Kurdistan Center for Gastroenetrology and Hepatology in Sulaimani city-Iraqi Kurdistan. All the 80 consecutive patients with hemorrhoids & rectal bleeding, seen in a period of 8 months were included in the study.

Inclusion Criteria: Adult male & female patients aged ≥ 16 years. All patients presenting with fresh bleeding per rectum (hematochesia) suspected of having only hemorrhoids & patients who had hemorrhoid surgery & recurrent bleeding per rectum.

Exclusion Criteria: Patients with suspected upper GI source of bleeding. All patients with BPR with established prior Colonoscopic diagnosis other than hemorrhoid. Patients in whom total colonoscopy could not be completed.

Ethical considerations Addressed & personal information was kept confidential.

The patients were fully informed about the research methodology & given the chance to accept or refuse to participate in the research.

The research proposal had ethical approval from the ethical committee of the Kurdistan board for medical specialties.

All cases in this study were hemodynamically stable & after standard colon cleaning with PEG solution, patients underwent colonoscopy after a proper anoscopy & DRE.

The data was collected using special forms. All findings were recorded.

Statistical Analysis:

Colonoscopic findings were compiled / analyzed using the statistical tests.

Descriptive statistics were used to calculate the Mean±SD of numerical data. Data was analyzed using SPSS version 22.

Results

A total of 80 patients presented with bleeding per rectum and internal piles were included in present study. Mean age of hemorrhoid patients was 45±16 years (range 17-80 years), 40% of them were in 17-40 years age group, and 40% were in the 41-60 years age group. Males were slightly more than females with male to female ratio as 1.05:1. All these findings were shown in table 1

Table 1 Patients demographics and characteristics

Patients characteristics	**No. (%)**
Total no. of patients	80
Age (mean ±SD) y	45.40±15.545
Age range	17-80
17 - 40 years	32(40.0)
41 - 60 years	32(40.0)
> 60 years	16(20.0)

<45 years	44(55.0)
>45 years	36(45.0)
Normal	45 (56.2)
Associated colonoscopic findings	35 (43.8)
Gender	
Male	41(51.3)
Female	39(48.8)
Residency	
Inside city	43(53.8)
Outside city	37(46.3)
Education	
Illiterate	17(21.3)
Primary school	24(30.0)
Intermediate and secondary school	21(26.3)
University Graduate	17(21.3)
Post Graduate	1 (1.3)
Occupation	
Employed	39(48.8)
Unemployed	4 (5.0)
Housewife	30(37.5)
Retired	7(8.8)
Smoking	
Yes	18(22.5)

No	62(77.5)
Marital Status	
Married	67(83.8)
Unmarried	13(16.3)

The common presenting symptom of hemorrhoid patients other than bleeding per rectum (BPR) was per anal pain (22.5%), perianal itching (22.5%); followed by constipation (11.3%), abdominal pain (6.3%), and weight loss (2.5%). All these findings were shown in table 2 and 3

Table 2 Character of BPR , past medical and surgical history

	No. (%)
Character of bleeding per rectum	
Bright red blood	62(77.5)
Passage of blood tinged mucus	9(11.3)
Blood on finger	9(11.3)
Relation of bleeding per rectum to defecation	
Start	23(28.8)
With	40(50)
After	17(21.3)
Pruritus ani	
Yes	18(22.5)
No	62(77.5)

Past medical history of chronic disease	
None	75(93.8)
Anal fissure	1(1.3)
Pelvic radiation	1(1.3)
Others	3(3.8)
Past surgical history	051(63.8)
Hemorrhoid surgery	12(15.0)
Colon	2(2.5)
Perianal	4(5)
Others	11(13.8)

Table 3 Associated features rather than bleeding per rectum

Associated features	**No. (%)**
Per anal pain	18(22.5)
Constipation	9 (11.3)
Weight loss	2 (2.5)
Abdominal pain	5 (6.3)
More than one feature	46(57.5)

Most of studied patients (64%) had first degree internal hemorrhoid, 24% of patients had second degree, 11% of them had third degree, and 1% had fourth degree internal hemorrhoid. All these findings were shown in table 4.

Table 4. Internal Hemorrhoids

Grades of internal hemorrhoids	No.(%)
Grade 1 internal pile	51(63.8)
Grade 2 internal pile	19 (23.8)
Grade 3 internal pile	9 (11.3)
Grade 4 internal pile	1(1.3)

More than half of patients had normal colonoscopy (56.3%), and the most common colonoscopic finding was Polyp (19%), polypectomy was done for most of them and sent for biopsy, two of them were large in size and suspicious so polypectomy done and biopsy taken. Other colonoscopic findings were proctitis and colitis (12.5%), solitary rectal ulcer (SRUS), colorectal carcinoma (CRC), ulcerative colitis (UC), divericuli, and fissure were present in 2.5% of patients. Presence of such percentage of polyps with suspicious two of them and presence of two patients with colorectal cancer is significant and make us to think whether all patients with internal hemorrhoids should be screened by colonoscopy or not?

Colonoscopy changed the treatment plan in many patients with findings, Polypectomy done for most patients with polyps and most of them have been sent for biopsy, patients with Colorectal Carcinoma have been sent for surgical and oncological departments for further evaluation and treatment, also colonoscopic examination changed the decision plan for those patients with hemorrhoids and coincidental findings of SRUS, UC, Diverticuli , Proctitis , and Fissure from previously decided hemorrhoid treatment to treat these findings according to their severity and necessity of treatment. All these findings were shown in table 5.

Table 5 Colonoscopic findings other than hemorrhoids

Colonoscopic findings	No. (%)
NORMAL	45(56.3)
SOLITARY RECTAL ULCER	2(2.5)
COLORECTAL MASS (malignancy)	2(2.5)
ULCERATIVE COLITIS	2(2.5)
DIVERTICULI	2(2.5)
POLYP	15(18.7)
PROCTITIS, COLITIS	10(12.5)
FISSURE	2(2.5)

Discussion

The common clinical presentations of studied patients were BPR, anal pain & constipation. This is consistent with results of Osborn et al /USA [90] reporting that BPR, pain & constipation are the main symptoms of patients with internal hemorrhoids. Current study showed that 64% had first-degree internal hemorrhoid, 24% had second degree, 11% had third degree & 1% had fourth degree. These findings are near to results of Riss study in Vienna [47]. Peak incidence occurred between 45 - 65 years. Mean age of patients in the current study is a somewhat lower than other studies (45.4 years). Hemorrhoids are equally distributed according to gender in this case series. There are controversies regarding gender distribution among hemorrhoid cases in literature. Peery [98], found 60% male, while Koning et al [100] found higher female gender (55%).

Thirty five patients (43.8%) had colonoscopic findings other than hemorrhoids, consistent with some studies while contradicts others [88,89]. Koning [100] reported malignancy in 10% of patients. In other study, colonoscopy showed colorectal cancer in 2 elderly patients (2.5%). Literature review showed incidence of colorectal cancer among hemorrhoid patients of about 1.7 % [99].

Ulcerative colitis was found in 2 cases (2.5%) in current study. Koning et al [100] reported IBD in 2.8% of cases. Diverticular disease was found in 2 cases (2.5%), this is consistent with some other studies. While some authors reported it as a most common associated finding reaching 39% [107]. In case of hemorrhoid, occurrence of associated diverticular disease increased with increasing age. The lower rate of diverticular disease in this report in comparison with others may be explained by the fact that the mean age of our patients is less than those reported in those studies [104].

Polyp was found in 15 cases (18%) in this study & polyps were actively bleeding in two cases. Co-incidence finding of polyps with hemorrhoid are highly variable in literature. Mark et al [100] reported that 35% of cases with hemorrhoids have polyps, Hennawy et all [97], associated polyp was found in 8% of cases.

Alyouzbaki et al [102] reported proctitis in 4.8% of cases & Anal fissure in 5.4%. We reported proctitis & colitis in 10 cases (12.5%).

Anal fissure was found in two of our cases (2.5%).

In spite of being diagnostic for hemorrhoid, colonoscopy helped in diagnosis of other associated conditions & changed the therapeutic modalities.

In 25 cases (31%), we found other diseases to be the cause of the hematochesia & recommended the surgical team to address them & deal with them as independent conditions.

Polypectomy done for most patients with polyps & sent for histopathology examination,

Patients with CRC were sent for Surgical/Oncological departments for further evaluation / treatment.

Decision change: Colonoscopic examination changed the decision plan for those patients with hemorrhoids & other colonoscopic findings of SRUS, UC, Proctitis & Fissure from previously decided hemorrhoid treatment to treat these findings according to their severity & necessity.

Conclusions And Recommendations:

There are significant colonoscopic findings in patients presented with hematochezia suggestive of hemorrhoidal disease, some of them serious like polyps & cancer that led to change in decisions, while others were incidental & not the cause of the hematochezia. These findings support the recommendations that every patient presented with haematochezia suggestive of hemorrhoidal disease to be evaluated by colonoscopy to exclude other serious colonic diseases before conducting any therapeutic hemmorhoidal intervention.

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The Role of Oesophagogastroduodenoscopy in Avoiding Unnecessary Cholecystectomies in Patients with Gallstones and Upper Abdominal Discomfort

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Abstract

Background and objective: Cholelithiasis is a common condition, 10-20% of the population will develop gallstones, the incidence increases with age. Only about 30% of asymptomatic patients will warrant surgery during their lifetime.Dyspeptic symptoms due to other abdominal conditions such as PUD, IBS, Functional dyspepsia, IBS& GERD are frequently attributed to Gallstones. The current study aimed to asses the role of upper endoscopy in patients with gallstones in avoiding unnecessary cholecystectomies.

Patients and methods: 124 patients were included in sulaimanyah city hospitals from october 2015 to february 2017 complaining of upper GIT symptoms and U/S evidence of gallstones and an oesophago-gastroduodenoscopy (**OGD**) is performed to exclude other possible explanation which may avoid unnecessary operation.

Results: Among 124 patient 99 (79.8%) were females and 25 (20.2%) were male, The mean age of studied patients was 46.4±14.5 years.The OGD findings of patients with Gallstones were normal 63 (50.8%), deudenal ulcer 24 (19.4%), non significant findings 24(19.4%), reflux esophagitis 10 (8.2%), gastrodudenitis 2 (1.6%)and fungal esophagitis 1 (0.8%) ,There was 12(9.6%) patients in whom surgery decision was changed while in 112(90.4%) the surgery was done.

Conclusion: OGD is a very useful tool in the preoperative evaluation of patient with Gallstones with upper gastrointestinal tract (GIT) symptoms.

KEY WORDS: Gastrointestinal tract, Oesophago-gastroduodenoscopy (**OGD**), Gallstones.

Introduction:

Gallstone is one of the commonest problems in GE practice. [1-3] The prevalence is 5-10% mostly among female & middle to elder age groups [4,-7], rising in many countries including Iraq. [8].In England 70000 & USA > 0.5 million cholecystectomies done each year. [9] Risk factors include ; advancing age , multiple pregnancies, obesity, repeated fluctuations in body weight, rapid weight loss >1.5 kg/week, high dose estrogens & Cholestyramine/fibrates. [10-12] Protective factors may include moderate exercise, coffee & moderate alcohol consumption. [13-15] Presentations of gallstones include asymptomatic & symptomatic ones which include: A. Biliary colic: a Moderate - Severe epigastric or right hypochondriac pain that last for 15 minutes to 6 hours or less than 24 hours , not associated with fever & can be associated with nausea / vomiting ,usually resolve spontaneously or by medications. [16-18] B. Symptomatic complications as acute pancreatitis, obstructive jaundice,cholecystitis) 0.2 -0.8% / annum, 0.3 - 1.2% if the stones are initially asymptomatic , 0.7 - 2% / annum if the stones are initially symptomatic, Other rare symptomatic complications include Acute cholangitis, Mucocele of gallbladder,Empyema of gallbladder,Gangrenous gallbladder, Biliary peritonitis, Porcelain gallbladder, Gallbladder cancer. [11, 19-21]

Management include 1. Non-surgical: Oral dissolution with bile acids successfully dissolved gallstones in an extremely limited patient population, especially in patients with symptomatic radiolucent gallstones < 15 mm within a functioning gallbladder.

Laproscopic cholecystectomy(LC): results in a shorter hospital stay, speedier recovery, reduction of postoperative pain&better cosmetic results compared with open surgery. [12, 22-24]

Indications for cholecystectomy for asymptomatic Gallstones may include: 1. Age: children & young adults. 2. Very large stones >3 cm. 3.Thick walled gallbladder >0.3 cm. 4.Porcelain gallbladder 5. Large sessile polyps.6.Race related like native American Indians. [13, 25-27]

Patients and methods:

A prospective study in sulaimanyah govermental hospitals (KCGH,Shar teaching hospital & Surgical teaching hospital). A total number of 124 patients with U/S diagnosed GSs & upper GIT symptoms were referred to do OGD. A full history &clinical exam carried out with emphasis on upper GIT & Biliary symptoms. Patients were followed out to see in how many patients the decision to do operation was changed in the short term follow-up of our study period. Inclusion criteria: any adult with U/S evidence of GSs & upper GIT symptoms.

Exclusion criteria: any case of complicated Gallstone including common bile duct stones,acute cholecystitis, pancreatitis, cholangitis.

Results:

The mean age of studied patients was 46.4±14.5 years, 29.9% of them were 40-49 years, 21% of them ≥60 years, 17.7% ,30-39 years, 17.7% ,50-59 years & 13.7% ,>10 years. Females were more than males with female to male ratio as 3.96:1 (Figure 1).

The presenting symptoms: Biliary colic (72.6%),Epigastric pain (22.6%) or other Dyspeptic symptoms (3.2%) &Heartburn (1.6%) (Figure 2).

The OGD findings: Normal 63 (50.8%) Abnormal findings; 49.2% as below: Duodenal ulcer 24 (19.4%) Non- significant findings 24(19.4%) Reflux esophagitis 10 (8.2%) Gastrodudenitis 2 (1.6%) Fungal esophagitis 1 (0.8%) (Figure 3).

The change in decision for surgery was observed among 9.7% of patients with Gallstones after OGD. In 90.3% there had been no change in decision (Figure 4).

There was a significant association (P= 0.02) between patients detected with duodenal ulcer by OGD & decision change (Table 1).

There was a significant association (P= 0.002) between Gallstone patients with abnormal OGD findings & decision change (Figure 5).

Figure 1: Age distribution of patients with Gallstones.

Figure 2: The presenting symptoms of patients with Gallstones.

Figure 3: OGD findings of patients with Gallstones.

Figure 4: Distribution of age according to decision change.

Figure 5: Distribution of OGD outcome according to decision change.

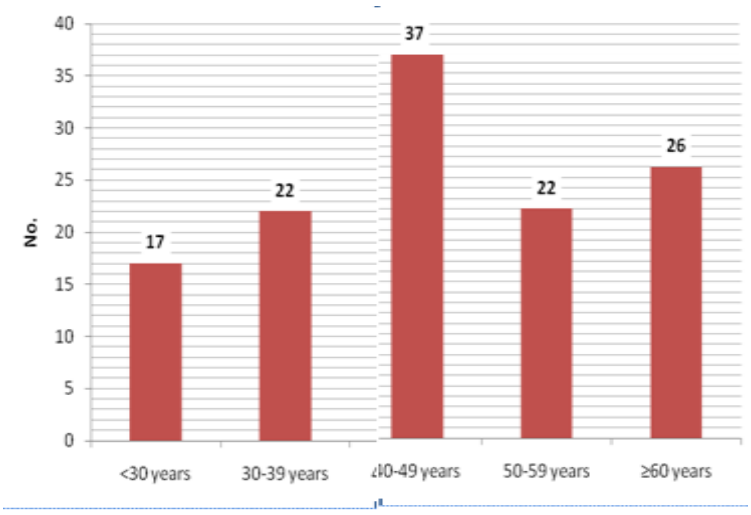
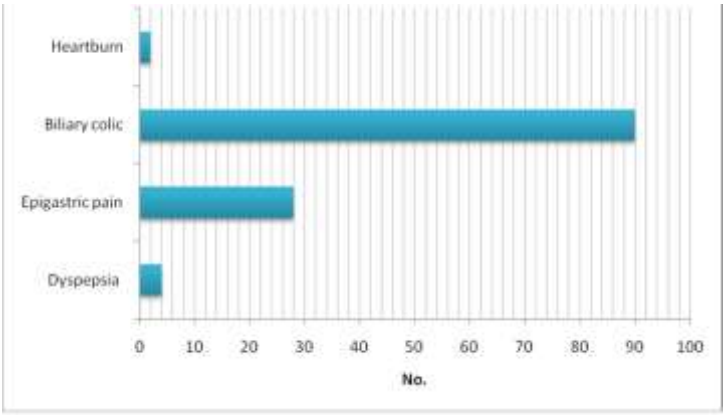


Figure 1:



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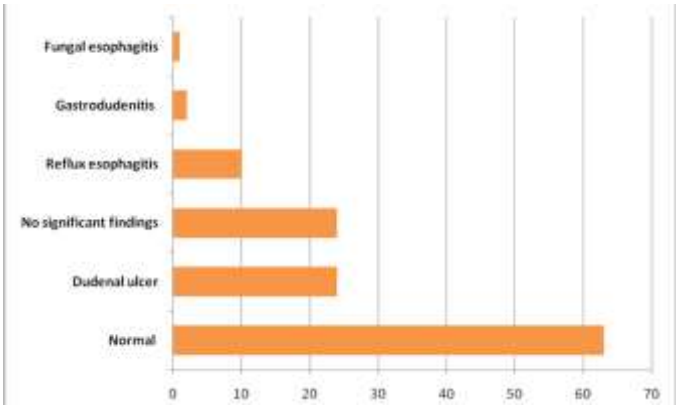

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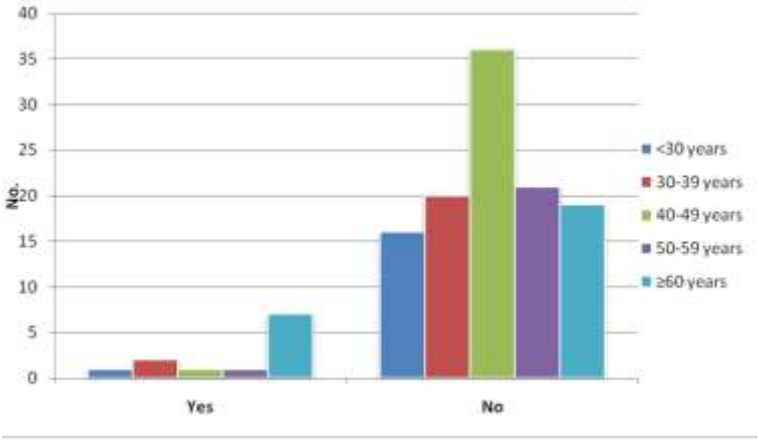

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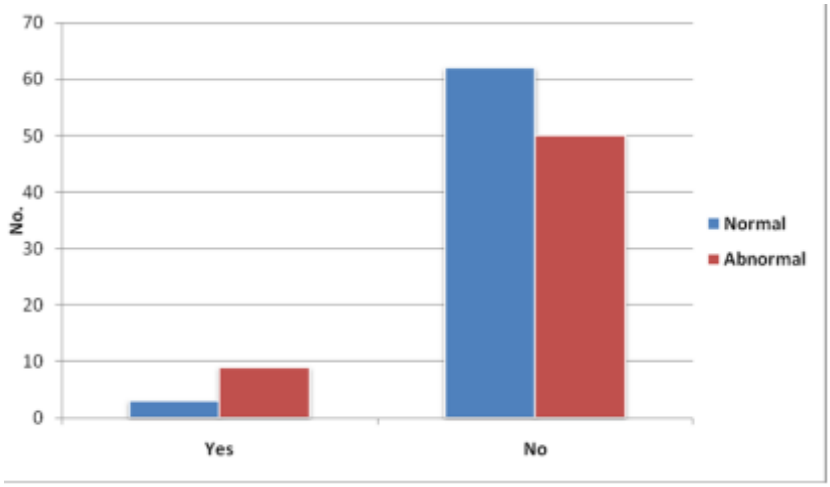

Figure 5:

Table 1: Distribution of OGD* findings of patients with Gallstones according to decision change.

Variable	No Surgery		Surgery		χ^2	P value
	No.	%	No.	%	13.3	0.02
Normal	1	8.3	62	55.4		
Duodenal Ulcer	5	41.7	19	17.0		
No significant findings	4	33.3	20	17.9		
Reflux esophagitis	1	8.3	9	8.0		
Gastroduodenitis	1	8.3	1	0.9		
Fungal esophagitis	0	-	1	0.9		

* OGD: Oesophago-gastroduodenoscopy

Discussion:

Our patients were 124 in number, female 99 (79.8%) , 25 (20.2%) and a female to male ratio of 3.96/1 ,similar prevalence observed in a study carried out in India. [28-33] In our study the OGD findings of patients with upper GIT symptoms and Gallstone were normal 63 (50.8%), duodenal ulcer 24 (19.4%), non-significant findings 24(19.4%), reflux esophagitis 10 (8.2%), gastroduodenitis 2 (1.6%) and fungal esophagitis 1 (0.8%). The results were near to results of a study carried out by Thybusch et al in Germany, which showed 50% of patients had pathological findings on OGD examination. [34]Another study in Germany recommend that OGD must be done before an elective cholecystectomy &showed that out of 960 patients for elective cholecystectomy, 589 underwent gastroscopy 56% had normal gastroscopy. [35]

In our study the change in decision for surgery was observed among 9.7% of patients with upper GIT symptoms and Gallstones after OGD while 90.3% of them had no change in decision &underwent operation.The results of OGD findings changed decision in the management plan in 8.3% and 11.7% of patients in previously mentioned study by Thybusch et al. and Rassek et al., respectively. [34, 35] A study in Poland showed that pathological findings were identified in 1187(42%) patients & the surgery was delayed for patients with ulcers until they finished their medical treatment , sixteen patients had complete resolution of symptoms after medical treatment therefore cholecystectomy was not performed. [36] In a study done in Sudan included 108 patients with gallstones & OGD was done revealed different pathological findings in 61 (56%) , Cholecystectomy was done for 82 (76%) & 26 were treated conservatively. [37] A study in India showed that in 89 patients the management plan had to be changed in 7.9% of patients based on the upper GI endoscopy findings (P value <0.001). [38] In a meta-analysis of 12 cohort studies a total of 6317 patients with cholelithiasis underwent OGD & in 36.3% abnormality was found in OGD but only 3.8% of patient surgery was avoided.[39] Another study by *Yavorski et al.*, recommend that patients who present with cholelithiasis &atypical abdominal pain undergo preoperative OGD, as they found that at least 9 per cent of the patients in their study had significant findings that altered their management. [40] In a study in India in 2016 , 216 patients with Gallstone underwent OGD, showed 100% who underwent LC, had relief of symptoms in patients with normal OGD finding while those with significant OGD findings either not went through surgery in 10(4.6%) or when surgery was done they had more gradual relief of symptoms in 6 months follow-up. [41] A study in England suggested that OGD should be considered as a routine investigation before LC especially in those, who present with overlapping upper GI symptoms. [42]

Conclusions:

1.Gallstones is frequently silent & upper GIT symptoms can be attributed to other pathologies in upper GIT.

2. OGD is a very useful tool which can be used in every case with Gallstone & upper GIT complains especially those with atypical symptoms.

3. OGD before elective cholecystectomy can help avoid unnecessary surgeries.

4. Biliary colic was the most important symptom that predicted negative OGDs & led to the decision of proceeding to surgery, so every effort should be done to take a good history of typical biliary colic in those patients.

Recommendations:

1.We recommend to evaluate patients with Gallstones very carefully to avoid doing un-necessary LC.

2.We highly recommend OGD as an appropriate evaluation of patients planned for elective cholecystectomies.

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Correlation of elevated cardiac troponin T level with severity and in-hospital outcomes in patients with acute ischemic stroke.

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Abstract

Background: Although elevated cardiac troponin T (cTnT) is a specific marker of acute coronary syndrome (ACS), its increment in patients with acute ischemic stroke is not clear. The aim of this study is to identify the relationships between high cTnT levels and stroke severity and some in-hospital outcomes.

Methods: This observational, cross-sectional study was conducted on 100 patients with acute ischemic stroke in Rizgary teaching hospital from January 2016 to January 2017. Patients were divided into two groups; group 1 patients (n=61) with normal cTnT level and group 2 patients (n=39) with elevated cTnT level. The relationships between cTnT levels and stroke severity and some in-hospital outcomes were assessed and compared between the two groups.

Results: In this study, cTnT was raised in 39 patients (39%). Patients with elevated cTnT levels were mainly males, had a significant higher prevalence of hypertension and diabetes mellitus than the normal cTnT group ($P<0.001$, for all). Systolic blood pressure (SBP) and total cholesterol were significantly higher ($P<0.008$ and <0.001, respectively) in group II patients than in group I. In addition, group II patients had more ECG changes, higher stroke scale and higher length of stay in hospital than in group I patients, and the differences were significant ($P<0.001$, for all). The incidence of aspiration pneumonia, seizures, hemorrhage inside the infarcted area, and death was significantly higher ($P<0.001$, for all) in group II patients than in group I patients.

Conclusion: Elevated serum cTnT level at hospital admission is highly correlated with severity and poor in-hospital outcomes in patients with acute ischemic stroke.

Key words: Cardiac troponin T (cTnT), Acute ischemic stroke, In-hospital outcomes.

Introduction:

Stroke is a common cause of mortality and morbidity worldwide.[1] The correlation between stroke and heart disease is established in many studies.[2] Embolism due to cardiac disease accounts for 15-20% of all strokes and after a stroke; patients are at high risk of developing many adverse cardiac outcomes.[3] Cardiac Troponin T (cTnT) is highly sensitive and specific marker of cardiac damage.[4] Several studies have noticed that elevated levels of cTnT are increased in 10-34% of patients with acute ischemic stroke.[5] Although the exact cause of troponin rise in acute ischemic stroke is not clear, it is suggested that the reason for this cardiac change resulted from excessive sympathetic nervous activity secondary to insular cortical damage.[6] Some studies have reported an association between an elevated troponin level with both mortality and poor outcomes in acute ischemic stroke.[7] Again, the clinical significance of such association is not clear. To date, and up to our knowledge, there is no previous study done regarding the same subject in Erbil city. The objectives of this study are to (1) assess the correlation between elevated serum cTnT levels and stroke severity, and (2) determine the effect of elevated serum cTnT on in-hospital outcomes in a group of patients with acute ischemic stroke in Erbil city-Iraq.

Materials and Methods:

This observational, cross-sectional study was conducted in Rizgary teaching hospital, department of neurology between January 2016 and January 2017 .A total of 100 patients with a diagnosis of acute ischemic stroke were enrolled in this study. According to serum cTnT level, the patients were classified into two groups; group I (patients with normal cTnT level, n=61), and group II (patients with elevated cTnT level, n= 39).

The inclusion criteria were patients with (1) acute ischemic stroke confirmed by either computed tomography (CT) scan or magnetic resonance imaging (MRI) of the brain within 24-hours of stroke onset; and (2) measurement of serum cTnT level (normal value 0.0-0.3 ng/ml)[8] within 24-hours of stroke onset, to patients with age $\geq$ 18 years and of both genders.

The exclusion criteria were patients with recent ischemic heart disease (acute coronary syndrome according to American college of cardiology/ American Heart Association [ACC/AHA]) within 2 weeks prior to stroke onset, recent coronary angioplasty or coronary bypass surgery, and other heart diseases or conditions that might increase serum cTnT level, such as congestive heart failure, valvular heart disease, end-stage renal disease, acute pulmonary embolism, chest trauma, rabdomyolysis, and chemotherapy. Patients with intracerebral or subarachnoid hemorrhage were ruled out by brain CT scan at the time of admission. All patients were assessed by a detailed history, physical examination, CT scan or MRI of the brain, electrocardiography (ECG), echocardiographic evaluation and other investigational tools. Blood samples were drawn to measure the serum cTnT level and other hematological parameters for each patient. The cut-off value for elevated serum cTnT was more than 0.3 ng/ml. The severity of the stroke was evaluated according to the National institute of Health Stroke Scale (NIHSS) [9]. A score of 1-4 is considered minor stroke, 5-15 is moderate stroke, 16-20 is moderately severe and more than 21 is severe stroke. In-hospital outcomes such as aspiration pneumonia, seizures, hemorrhage inside infarction and death were evaluated in both groups.

The data were collected by interviewing the patients using a questionnaire designed by the researchers. The questionnaire included information about socio-demographic data (age, gender,..), and risk factors like hypertension and diabetes mellitus,

Ethical considerations: The study protocol was approved by the ethics committee of the College of Medicine, Hawler Medical University. This study was conducted by using an informed verbal consent from the patients prior to participation in the study. The purpose of the study was carefully explained to each patient.

Statistical analysis of data:

Data were analyzed using the statistical package for social sciences (SPSS, version 19). Student's t test for two independent samples was used to compare means. Correlation coefficient (r) was obtained to demonstrate the correlations between variables. A 'P' value of ≤ 0.05 was considered as statistically significant.

Results:

A total of 100 patients with acute ischemic stroke were enrolled in this study. Serum cTnT was elevated in 39 patients (39%). The patients were classified into two groups according to serum cTnT levels; group I (patients with normal cTnT level (0.0-0.3 ng/ml), n=61), and group II (patients with elevated cTnT level (more than 0.3 ng/ml), n= 39). Basic and clinical characteristics were compared between the two groups, as shown in Table 1. Patients with elevated cTnT levels were mainly males, had a higher prevalence of hypertension and diabetes mellitus than the normal cTnT group , and the differences were significant (P<0.001, for all). Systolic blood pressure (SBP) and total cholesterol were significantly higher (P<0.008 and <0.001, respectively) in group II patients than in group I. In addition, group II patients had more ECG changes, higher stroke scale and higher length of stay in hospital than in group I patients, and the differences were significant (P<0.001, for all).

Table 1: Basic and clinical characteristics of patients with normal and elevated serum cTnT levels.

Variables	Group I **Normal cTnT N=61**		Group II **Elevated cTnT** N=39		p
	Mean	**SD**	**Mean**	**SD**	
Age(y.)	66.1	11.66	65	10.8	0.6
Male (%)	47.5		58.9		<0.001
Hypertension (%)	65.5		74.3		<0.001
Diabetes (%)	32.7		53.8		<0.001
Systolic BP(mmHg)	152.2	24.8	165.5	22.8	0.008
Diastolic BP(mmHg)	87	13.1	91.9	12.8	0.07

Cholesterol(mg/dl)	178.5	52.1	187.6	31.4	0.001
TG(mg/dl)	122.9	67.42	136.9	78.2	0.36
LDL(mg/dl)	102.4	29.1	106.4	32.1	0.4
HDL(mg/dl)	39.6	12.4	35.5	9.3	0.06
BU(mg/dl)	42.7	15.9	44.5	22.1	0.6
SC(mg/dl)	1	0.31	1	0.44	0.48
ECG changes	3.2		33.3		<0.001
cTnT	0.1	0.03	49.9	144.8	<0.001
Stroke scale	4	3.5	9.7	5.3	<0.001
Length of stay(days)	5	2.3	7.4	3.7	<0.001

Table 2: Incidence of in-hospital outcomes in both studied groups.

Variables	Group I **Normal cTnT N=61**		Group II **Elevated cTnT** N=39		p
	N	**%**	**N**	**%**	
Aspiration pneumonia	5	8.1	5	12.8	<0.001
Seizures	0	0	2	5.1	<0.001
Hemorrhage	0	0	2	5.1	<0.001
Death	3	4.9	6	15.3	<0.001

Table 2 shows the incidence of in-hospital outcomes in both studied groups. The incidence of aspiration pneumonia, seizures, hemorrhage inside the infarcted area, and death was significantly higher (P<0.001, for all) in group II patients than in group I patients.

Discussion:

In the current study, high serum cTnT level was detected in 39% of patients with acute ischemic stroke, and was associated with severity and poor in-hospital outcomes. The prevalence of elevated cTnT level in acute ischemic stroke varies from study to study but has been reported to be as high as 34%.[5] In consistence with the present study, other studies have confirmed the presence of high troponin levels in ischemic stroke [5,10-12]. The relationship between cerebrovascular and cardiovascular disease is a little bit complex and the cause of troponin increment is still poorly understood. It has been suggested that the myocardial damage observed in acute stroke insult is due to myocyte damage (myocytolysis) due to activation of sympathoadrenal system that may be linked

to insular damage.[11] Epinephrine and cortisol concentrations are elevated after a stroke and higher levels have been reported in association with myocardial damage.[5] The brain-heart connection was described previously by Levy. He mentioned that changes in central nervous system metabolism can affect cardiac function.[14] Acute ischemic strokes can induce diffuse myocardial damage characterized by micro-islands of necrosis and subendocardial hemorrhage. [14]

In concordance with the present study, increased mortality has been predicted by elevated troponin levels in multiple studies [7.15,16]. Stroke can induce a considerable stress on the patient's heart causing troponin to be elevated and this might be an indication of a lower cardiac tolerance caused by the acute stroke.[17] This might explain the correlation of elevated serum cTnT with both the severity and the poor in-hospital outcomes found in this study and for this reason, doctors in charge of stroke unit should be more careful when dealing with these patients.

There is controversy whether troponin should be routinely checked in patients with acute stroke. Recent UK acute stroke guidelines from the National Institute of Clinical Excellence [18] and the Scottish Intercollegiate Guidelines Network [19] do not recommend the routine checking of cardiac enzymes. However, the American Stroke Association[20] does recommend this.

Conclusion:

Elevated serum cTnT levels in the absence of clinical evidence of recent coronary artery disease were associated with stroke severity, longer in-hospital stay and poor in-hospital outcome**s.**

Recommendations:

(1) A large prospective study with assessment of both short and long-term clinical outcomes is needed in future studies to clarify the clinical implications of high serum cTnT levels in acute ischemic stroke.

(2) We suggest that doctors in neurology unit would better consider adding a serum cTnT level to their routine testing when admitting patients with acute ischemic stroke.

Limitations:

Our study has few limitations. First, our sample study was low. A larger study population is needed in future. Second, we depend on single baseline blood sample in detecting cTnT level. Repeated assays could provide additional information on the evolution of myocardial damage.

Conflicts of interest:

The authors report no conflicts of interest

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The Role of Troponin I as A Predictor of Early Left Ventricular Systolic Dysfunction in Acute ST Segment Elevation Myocardial Infarction

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Abstract

Background and Objectives:
The cardiac troponin provides useful information for the extent of injury suffered by the myocardium and left ventricular systolic dysfunction. We sought to assess the role of admission troponin I level in patients with acute ST-elevation myocardial infarction to predict early Left Ventricle systolic dysfunction and regional wall motion abnormality diagnosed by Transthoracic Echocardiography.

Patients and Methods
In a cross sectional study of 52 consecutive patients (37 male, 15 female), their mean age (60.6 + 13.3) years with acute ST elevation myocardial infarction who had been admitted to the Coronary Care Unit at Hawler Teaching Hospital from October 2016 to April 2017 were enrolled in this study. Patients were classified according to their initial troponin I level in to: Normal troponin I (< 0.5 ng/ml), Medium troponin I (1 to 3 times the upper normal level) and high troponin I (3 times the upper normal level). Transthoracic echocardiography was done to assess the left ventricular systolic function and regional wall abnormalities.

Results
High troponin I level was associated with high Global Registry for Acute Coronary Events (GRACE) score (p = 0.002), and high frequency rate of left ventricular regional wall abnormalities (p=0.025). Patients with higher troponin I has higher frequency of left ventricular systolic dysfunction but without statistical significant value.

Conclusion
Elevated troponin I values may predict early left ventricular systolic dysfunction, regional wall motion abnormality as well as high GRACE score.

Key words: Troponin I, STEMI, AMI

Introduction

Cardiovascular disease (CVD) is now the most common cause of death worldwide[1]. The global burden of IHD deaths has shifted to low-and-middle income countries as lifestyles approach those of high income countries[2]. Ischemic heart disease is the leading cause of death in Iraq, it kills 27.5 thousand people annually. Iraq is in rank 22 among other country in which there is highest mortality related to coronary artery disease and the second in Arab countries[3]. According to the 2016 Iraq profile in the institute of health metrics and evaluation IHD is the first cause of premature death[4].

ST segment elevation myocardial infarction (STEMI) usually occurs when coronary blood flow stopped abruptly after a thrombotic occlusion of a coronary artery previously affected by atherosclerosis[1].

Cardiac troponin I (cTnI) is a component of the contractile apparatus of myocardial cells and is expressed almost exclusively in the heart[5]. it has N-terminal extension (amino acids 1–30) that is not present in fast Troponin I and slow Troponin I[6].

Cardiac troponin has been proven to be a potent, independent indicator of recurrent ischemic events, and an estimate for the risk of death among patients presenting with acute coronary syndrome (ACS) [7]; it has not only diagnostic, but prognostic importance as well[8]. The troponin provides a window into the heart by allowing the physician to track the extent of injury suffered by the myocardium. It provides useful information for early risk assessment that is complementary to the determination of cardiac function and volumes especially in (STEMI) patients[9].

Serum troponin I concentration has a strong negative correlation with left ventricular ejection fraction after first acute myocardial infarction, and hence can be used to assess the left ventricular ejection fraction (LVEF) in patients with first myocardial infarction (MI)[10].

Echocardiography is an important tool for assessment of acute MI because of their ability to detect wall motion abnormalities or loss of viable myocardium in the presence of elevated cardiac biomarker values[11]. the measurement of LVEF has prognostic implications[12] ; Reduced LVEF is associated with greater mortality among patients with coronary artery disease[13].

The Global Registry of Acute Coronary Events (GRACE) investigators have published models derived from the GRACE registry to predict mortality in-hospital as well as at six months[14]. The use of the GRACE risk score for predicting in-hospital mortality was validated in a contemporary cohort of patients with STEMI[15].

The GRACE registry data set has been harnessed to develop a simple, accurate, and widely used risk-prediction tool, which has been validated in multiple populations. The value of the GRACE risk score is supported by its inclusion in European and American clinical guidelines on the management of ACS[16].

We sought to assess the role of admission troponin I level on the development of early Left Ventricle systolic dysfunction (LVSD) and regional wall motion abnormality (RWMA) diagnosed by Transthoracic Echocardiography in patients with acute STEMI.

Patients and methods

This is a cross sectional study done on patients with first time STEMI who had been admitted to the coronary care unit (CCU) at Hawler Teaching Hospital from October 2016 to April 2017.

A total 52 consecutive Patients with first attack STEMI of both gender and ages more than 18 years who presented within 24 hours from onset of symptoms and have had no chance to do percutaneous coronary intervention (PCI) were included in this study.

The following patients were excluded: Patients who had ischemic heart diseases, heart failure, left bundle branch block, Wolf Parkinson White syndrome, rheumatic heart diseases, congenital heart diseases, valvular heart diseases, myocarditis, sepsis, anemia, pulmonary embolus, arrhythmias, stroke, and renal failure.

The term STEMI used when the following criteria meets the diagnosis: detection of a rise of cardiac troponin I, with Symptoms of ischemia and new ST elevation at the J-point in two contiguous leads with the cut off points ≥ 0.1 mV in all leads other than leads V2-V3where the following cut off apply: ≥ 0.2 mV in men or ≥ 0.15 mV in women in the absence of Left ventricular hypertrophy or Left bundle branch block[5].

The risk factors for ischemic heart disease where recorded including diabetes mellitus either diagnosed on admission by plasma glucose in a random venous sample ≥ 200 mg/dl or fasting plasma glucose ≥126 mg/dl[17], or patient already on oral hypoglycemic agents or using insulin.

Hypertension defined as patients already diagnosed or on treatment for hypertension or hospital reading of systolic blood pressure ≥140 mmHg and diastolic blood pressure ≥ 90mmHg were regarded as hypertension[18,5].

Body mass index (BMI) was calculated as weight in kilograms divided by height in meters squared, over weight was defined as BMI of 25–30; obesity was defined as a BMI of 30 or higher[19].

Smoking, family history of ischemic heart disease (IHD) in first-degree relatives was recorded, a proper history taking, physical and systemic examination had been done for all the patients.

The patients with STEMI who admitted to the CCU within 12 hours of onset of symptoms were received thrombolytic therapy unless there were an obvious contraindication or patient refused to be thrombolysed.

Resting electrocardiogram and laboratory studies had been done for all patients, including, random blood sugar on admission, complete blood count , serum electrolytes, and renal function test.

Venous blood was withdrawn from patients at the time of admission, the blood sample was tested for Troponin I using Nano-CheckTM AMI Cardiac Test which is an immune chromatography assay for the quantitative/qualitative determination of the three cardiac markers (cTnl, CK-MB, and Myoglobin), the normal cut off value for troponin I in our center is <0.5ng/ml according to the kit reference value with Sensitivity and Specificity of 96.1% and 97.8%.

The time from onset of symptoms to blood sampling for troponin was recorded and Patients were classified according to their initial troponin I level in to three groups: normal troponin(had no elevation ,Tn-I < 0.5 ng/ml), Medium troponin(had Tn-I levels between 1 to 3 times the upper normal level, 0.5– 1.5 ng/ml) and high troponin (had more than 3 times the upper normal level, >1.5ng/ml)[20].

Our patients were Also had estimated risk of in hospital death according the GRACE risk score system were eight factors used to calculate the score: age, heart rate, systolic blood pressure, renal function, congestive heart failure, ST-segment deviation, cardiac arrest, elevated cardiac biomarkers , The patients are classified in to low (score 49-125), intermediate (score 126- 154), and high (score 155-319) risk groups[21].

Transthoracic two-dimensional Color Doppler Echocardiography had been performed for all patients within 3 days of admission to the CCU using Vivid E9 GE (2015). Ejection fraction was determined by 2D guided M-mode approach[22]. The data gathered for ejection fraction and regional wall abnormality if present. Left ventricular ejection fractions of ≤40% are suggestive of heart failure

with reduced ejection fraction[23]; regional myocardial function is assessed on the basis of the observed wall thickening and endocardial motion of the myocardial segment[22].

The three groups were evaluated and compared according to the baseline characteristics of the study populations (demographic and risk factors), the mean time from onset of symptoms to blood sampling for troponin level, early in hospital outcome for arrhythmias (ventricular tachycardia, ventricular fibrillation, atrial fibrillation), cardiogenic shock, pulmonary edema, syncope, bleeding, mortality, GRACE risk score for in hospital outcome, and echocardiographic findings.

Verbal and written consent obtained from all patients, and this study is approved by the ethical committee of Kurdistan Board for Medical specialties.

Statistical analysis:

Data were analyzed using the Statistical Package for Social Sciences (SPSS, version 22). Chi square test of association was used to compare between proportions. When the expected count of more than 20% of the cells of the table was less than 5, Fisher's exact test was used. Analysis of variance (ANOVA) was used to assess the variability between and within the three groups. A post hoc test (LSD) was used to compare each two groups. A p value of ≤ 0.05 was considered statistically significant.

Results

Fifty-two patients with acute STEMI had been included in the study. Their mean age were 60.6 ±13.3 years, ranging from 23 to 86 year. The median was 60 years (4 patients ,7.7%) were less than 45 years old, and more than half (29 patients,55.8%) aged 45-64 years. The majority (37 patients, 71.2%) were males and (15 patients, 28.8%) were female, (59.6%) of patients had hypertension, (51.9%) were smoker, (38.5%) were diabetics and (26.9%) had positive family history of IHD, as shown in table 1.

Table 1. Demographic and clinical characteristics of patients with acute coronary Syndrome

Variables	**No.(52)**	**(%)**
Ages		
<45	4	(7.7)
45-64	29	(55.8)
≥65	19	(36.5)
Gender		
Male	37	(71.2)
Female	15	(28.8)
Smoking	27	(51.9)
Family history	14	(26.9)
Hypertension	31	(59.6)
Diabetes Mellitus	20	(38.5)

The association between BMI and troponin I was significant (p = 0.004), but in spite of that, the pattern was not consistent where high proportions of the normal weight and obese had high troponin, while none of the over-weight patients had high troponin. No significant association was detected between troponin I level with age, gender, hypertension, smoking and family history of ischemic heart disease, as shown in table 2.

Table 2. Correlation of risk factors with troponin I level.

Risk Factors		**Troponin I level ng/ml**						**P**
		<0.5		**0.5-1.5**		**>1.5**		
		No.18		**No.9**		**No.25**		
		N0	**(%)**	**No.**	**(%)**	**No.**	**(%)**	
Age	**<45**	2	(50)	0	(0)	2	(50)	0.173*
	45-64	12	(41.4)	7	(24.1)	10	(34.5)	
	≥65	4	(21.1)	2	(10.5)	13	(68.4)	
Gender	**Male**	14	(37.8)	7	(18.9)	16	(43.2)	0.549
	Female	4	(26.7)	2	(13.3)	9	(60)	
BMI	**<25**	5	(27.8)	1	(5.6)	12	(66.7)	0.004*
	25-29	7	(77.8)	2	(22.2)	0	(0)	
	≥30	6	(240	6	(24)	13	(52)	
Smoking		12	(44.4)	6	(22.2)	9	(33.3)	0.089*
Family history		6	(42.9)	1	(21.1)	7	(50)	0.546*
Hypertension		12	(38.7)	3	(9.7)	16	(51.6)	0.207
Diabetes mellitus		4	(20)	3	(15)	13	(65)	0.133

*****Fisher's exact test. **BMI**: Body mass index

The associations between troponin I level and almost all early in-hospital outcomes were not significant as shown in table 3.

Table 3. Correlation of in-Hospital outcomes with troponin I level.

IN-HOSPITAL OUTCOMES	**Troponin I level ng/ml**						**P**
	<0.5		**0.5-1.5**		**>1.5**		
	N0	**(%)**	**No.**	**(%)**	**No.**	**(%)**	
Ventricular tachycardia	2	(11.1)	0	(0)	0	(0)	0.143*
Ventricular fibrillation	0	(0)	0	(0)	0	(0)	NA
Atrial fibrillation	0	(0)	0	(0)	0	(0)	NA
Ventricular ectopic beat	2	(11.1)	4	(44.4)	4	(16)	0.144*
Pulmonary edema	0	(0)	0	(0)	5	(20)	0.077*
Bleeding	2	(11.1)	0	(0)	0	(0)	0.143*
Cardiogenic Shock	0	(0)	1	(11.1)	3	(12)	0.371*
Syncope	2	(11.1)	0	(0)	3	(12)	0.698*
Death	0	(0)	1	(11.10	1	(4)	0.434*

*****By Fisher's exact test

High troponin I level (>1.5ng/ml) was associated with high GRACE score (≥155) were (11 patients, 44%) of those with high troponin level, had high GRACE score, compared with (3 patients, 33.3%) of those of medium troponin level (0.5-1.5ng/ml), and (4patients, 22.2%) of those with low troponin level (<0.5ngm/ml) (p = 0.002). as shown in table 4.

Table 4. Correlation of GRACE mortality score with troponin I level.

GRACE mortality score	**Troponin I level ng/ml**						**P**
	<0.5		**0.5-1.5**		**>1.5**		
	No. 18		**No.9**		**No.25**		
	N0	**(%)**	**No.**	**(%)**	**No.**	**(%)**	
<126	10	(5.6)	0	(0)	2	(8)	0.002
126-154	4	(22.2)	6	(66.7)	12	(48)	
>155	4	(22.2)	3	(33.3)	11	(44)	

GRACE: Global Registry of Acute Coronary Events

The higher the troponin level, the higher the frequency rate of LVSD was observed, but the difference between the proportions was not significant. The association between troponin level and RWMA was significant, where it is evident that all of those with medium (9 patients, 100%) and high troponin level (25 patients, 100%) had RWMA compared with (14 patients, 77.8%) of low troponin level (p = 0.025). table 5.

Table 5. Correlation of left ventricular systolic dysfunction with troponin I level.

	Troponin level ng/ml						**P**
	<0.5		**0.5-1.5**		**>1.5**		
	N0	**(%)**	**No.**	**(%)**	**No.**	**(%)**	
LVSD	4	(22.2)	3	(33.3)	9	(36)	0.617
RWMA	14	(77.8)	9	(100)	25	(100)	0.025*

* By fisher's exact test

LVSD: Left ventricular systolic dysfunction. RWMA: Regional wall motion abnormalities

Disscusion

This study was done as an attempt to evaluate the role of troponin I to predict the development of early LVSD diagnosed by Transthoracic Echocardiography in patients with first STEMI.

Results showed that the majority of patients (71.2%) were males and (28.8%) were female, this is consistent with Andreotti et al[24]who demonstrated that the incidence of ACS is lower in women than men in all ages and Rosengren et al[25] who found that women presented more often with AMI without ST elevation or unstable angina and less often with STEMI compared to men.

The most common risk factor in the present study was hypertension (59.6%), Smoking (51.9%), Diabetes mellitus was (38.5 %) while family history of ischemic heart disease was (14 %), which was similar to El-Menyar et al[26]. in regard to smoking 52%, and family history (13 %.) While hypertension and diabetes was lower than this study (33 %, 32%).

No significant association was detected between troponin I level with age, gender, hypertension, diabetes mellitus, family history of IHD, and smoking; this is in parallel with Matetzky et al[27]. and Bhatt et al[28].

The association between BMI and troponin was significant (p = 0.004), but in spite of that, the pattern was not consistent where high proportions of the normal weight and obese had high troponin, while none of the over-weight patients had high troponin. While Cepeda-Valery et al[29] demonstrated that obesity was associated with lower peak troponin I as an estimation for infarction size in STEMI but Bhatt et al[28] and Chia et al[30].found no association between troponin I and BMI.

In contrary to other studies, no significant association was found between early in-hospital outcomes with troponin I level[26, 29], this may be explained by small number of patients in this study, but it's worth to mention that higher rate of pulmonary edema, syncope, cardiogenic shock were observed in patients with high troponin level and all deaths (two cases) were of high and medium troponin level.

High GRACE score was found in 44% of those with high troponin level, compared with 33.3% of those of medium troponin level, and 22.2% of those with low troponin level which was statistically significant (p = 0.002).this is in agreement with Baptista et al[31]. who found high correlation between GRACE score and troponin I level (p=<0.001).

This study revealed the higher the troponin level, the higher the frequency rate of LVSD, but the difference between the proportions was statistically not significant ,while Matetzky et al[27] found that

the pre discharge LVEF determined by using Simpson's biplane method was significantly lower in patients with elevated admission cTnI (p=0.04) This can be explained by the difference in sample size and the way of estimation of the ejection fraction were we depended on the 2D M-mode method for the calculation of ejection fraction.

The association between troponin level and RWMA was significant (p = 0.025), where it is evident that all of those with medium and high troponin level had RWMA compared with 77.8% of those with low troponin level. This is consistent with Battioni et al[32], and with a study done in Iran by Hajsadeghi S. et al[33] were Cardiac Troponin I Level and regional wall motion score index was Positively Correlated (P= < 0.001).

Limitations

The main limitation of our study is it's a small size sample with short duration of follow up.

Conclusion

Elevated troponin I values may predict early left ventricular systolic dysfunction, regional wall motion abnormality as well as high GRACE risk score in the early phase of admission.

Recommendations : Large-scale multicenter prospective studies needed to farther evaluate the role of troponin I on early left ventricular systolic dysfunction and farther study to evaluate the role of BMI on troponin level.

Conflicts of Interest

The authors report no conflicts of interest.

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Diuretic efficacy of *Matricaria chamomilla* in normotensive and salt-induced hypertensive rats

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Abstract

Background and objectives: Traditionally Chamomile (Matricaria chamomilla L.) has various medicinal uses. It has soothing, calming, sedative, and anti-inflammatory effects. The present study was designed to evaluate the effectiveness of decoction of Chamomile on urine flow rate, urinary and serum electrolyte concentration, urinary sodium and potassium excretion rates, urine and serum creatinine concentration, glomerular filtration rate, and the percentage of reabsorbed of filtered sodium, in normal and salt loaded hypertensive rats.

Methods: The study was carried out on 30 rats, which were divided into two groups. The first group involved twelve normotensive rats and were subdivided into two subgroups each of 6 rats. The first subgroup served as a control group. The second subgroup received decoction Chamomile orally for 3 weeks. The second group included 18 induced hypertensive rats and were divided into 3 subgroups each of 6 rats. The first subgroup served as a positive control. The second and third subgroups received decoction of Chamomile and of Chlorthalidone respectively.

Results: Chamomile decoction produced a significant increase in urine flow, Sodium excretion rate, Glomerular filtration rate and urinary creatinine level without significant effects on blood pressure, heart rate, and serum creatinine and blood urea in normal rats. Unlike Cholothalodone Chamomile decoction did not induce diuresis and has no significant effects on blood pressure in normal and hypertensive rate. However, the same dose of chamomile significantly increased serum potassium level in both normal and hypertensive rats.

Conclusion: Chamomile has mild diuretic activity in normal rats and its effects resemble that of potassium sparing diuretics.

Key: ***Matricaria chamomilla***, Cholothalodone, Diuretic, Hypertensive rats

Introduction:

Diuretics have been used effectively to treat millions of hypertensive patients. They reduce both systolic and diastolic blood pressures in the most of hypertensive patients, They are administered alone or in combination with other antihypertensive agents form the basis of therapy for the majority of hypertensive patients [1]. Because of their efficacy, low cost, and low side effects profile, diuretics are first choice to be prescribed for patients with hypertension, as well as their synergistic effect when combined with other antihypertensive agents; and their usefulness in patients with heart failure [2].

Traditionally, in most countries all over the world many plants have been used for their diuretic effect, for example the ripe fruits of *Carum carvi* and the leaves of *Tanacetum vulgare* are two widely available plant materials, that are used as diuretics in the Moroccan traditional medicine [3]. Urticaria diocia, is another example, which is used by Kurdistan folks [4].

Many other herbal plants exerting diuretic property, were traditionally used, e.g. *Mangifera indica, Mimosa pudica, Lipidium sativum, and Achyranthes aspera* [5]. *Doradilla* that has a long history in the Mexican traditional system of medicine for gall and renal stones, through its diuretic action [6].

Chamomile or *Matricaria chamomilla* L. (*M. chamomilla*) is usually referred to as the "star among medicinal species" a well-known medicinal plant species from the Asteraceae family. It has multitherapeutic, cosmetic, and nutritional values have been established through years of traditional and scientific uses and researches, it is one of the highly favored and much used medicinal plant in folk and traditional medicine [7].

Matricaria Chamomilla has a wide range of therapeutic actions; soothing, calming, sedative, relaxation, anti-inflammation, treating indigestion, hay fever, asthma, morning sickness, eczema, and sore nipples [8]. About 120 chemical constituents have been identified in chamomiles as secondary metabolites, including 28 treptinoids, 36 flavonoids, and 52 additional compounds with pharmacological activity [9].

Because little information is available about the activity of *M. chamomilla* to produce diuresis, therefore this study is undertaken to evaluate the activity of *M. chamomilla* decoction as a diuretic agent in normotensive and hypertensive animal model.

Materials and Methods

Preparation of *M. chamomilla* decoction.

Dry *M. chamomilla* flowers were weighed and crushed to powder with a marble pestle and mortar, then 15% w/v (150 g was added in 1000 ml of distilled water) heated in a steel kettle and allowed to boil for 15 minutes. The flask was then placed on a shaker for four hours, at room temperature. After shaking, the suspension was filtered through a series of filter papers to avoid the bacterial contamination and stored at 4°C until use [10]. After that, it's filled with distilled water up to 1000 ml for making up the desired volume for dosage calculation, each rat was give 3 ml of the decoction (1.3g/kg/day) by oral gavages every morning during the 21 days of the study.

Experimental Design.

Diuretic activity of prepared *M. chamomilla* decoction was studied on 30 adult male Wistar rats, weighing 300–350 gram which were divided into two groups. The first group involved twelve normotensive rats, six rats sacrificed as a negative control and the other six rats received 3ml 15% decoction of *M. chamomilla* every day during the 21 days of study period. The second group involved 18 hypertensive rats. Hypertension was induced by sodium load diet and water [11]. The hypertensive rats were subdivided into three subgroups, each of six rats. The first subgroup served as a positive control. The second and third subgroups received 3 ml of 15% decoction *Matricaria Chamomilla* by oral gavages, and 1 ml (5mg/kg) chlorthalidone respectively. All the rats were exposed to the same environment.

Group I: Normal rats served as negative control.

Group II: Normal rats treated with decoction *M. chamomilla* (1.3 g/kg/day).

Group III: Hypertensive rats served as positive control.

Group IV: Hypertensive rats given 15% decoction *M. chamomilla* (1.3 g/kg/day).

Group VI: Hypertensive rats given chlorthalidone (5 mg/Kg).

Sample collections.

Urine samples.

Urine was collected 24 hour based, and measured after dosing by putting the rats in the metabolic cages. Then urine volume of each rat was measured, and put in a urine container and the samples were taken to the laboratory for creatinine and electrolytes in urine (sodium and potassium) analysis.

Blood samples.

At the end of drug and herbal treatment, all the rats were fasted overnight allowed free access to water. At the morning of the next day, the rats were anesthetized by a combination of ketamine in a dose of 75mg/kg with xylazine in a dose of 10 mg/kg intrapertoneally (IP) (Gallaly, 2012), then

blood samples were taken from their hearts by direct cardiac puncture by the needle of a plastic syringe.

Statistical Analysis

The results of serum and urine electrolytes concentrations, serum and urine creatinine concentration, serum urea concentration, urine flow, sodium excretion rate, potassium excretion rate, glomerular filtration rate, percentage of sodium reabsorbed of filtered load, blood pressure and heart rate of the rats were analyzed statistically using SPSS software program package 21 and are expressed as mean ± standard errors of means (M± SEM). Data analysis was made using one-way analysis of variables (ANOVA). Comparison was made between groups using Duncan test and unpaired student t-test. A *p* value of ≤ 0.05 was considered statistically significant.

Results

Effects of *M. chamomilla* decoction (15%) on blood pressure and heart rate in normal rats.

The blood pressure of normal rats treated with *M. chamomilla* was non-significantly higher than the normal control rats (Table 1).

Table 1 Effects of *M. chamomilla* decoction (15%) on blood pressure and heart rate in normal rats.

Parameters	Normal Rats (n=6)	Normal Rats /MC (n=6)	P value
Blood Pressure (mmHg)	106 ±4	110 ±4	0.347
Heart Rate (Beats/minute)	333 ±41	359 ±10	0.537

*MC: *Matricaria chamomilla.*

Effects of *M. chamomilla* decoction (15%) on urine flow, sodium excretion rate, potassium excretion rate, GFR and % Na^+ reabsorption of filtered load in normal rats.

The urine flow of the normal rats treated with 15% decoction of *M. chamomilla* was significantly higher than the normal rats that did not receive the plant decoction, (Table 2). Sodium excretion rate, was significantly increased in normal rats received *M. chamomilla* decoction. There was a slight and non-significant elevation in Potassium excretion rate of normal rats received *M. chamomilla* decoction, (Table 2). Glomerular filtration rate was significantly increased in *M. chamomilla* treated rats by four folds in comparison to non-treated normal rats. The percentage of sodium ion reabsorption was not significantly increased in the normal rats following daily administration *M. chamomilla* decoction, (Table 2).

Table 2. Effects of *M. chamomilla* decoction (15%) on urine flow, sodium excretion rate, potassium excretion rate, GFR and % Na^+ reabsorption of filtered load in normal rats.

Parameters	Normal Rats (n=6)	Norm4al Rats /MC (n=6)	P value
Urine flow (ml/min/kg)	0.0144 ±0.0015	0.0348 ±0.0037	0.001
Na^+ excretion rate (µEq/min/kg)	2.98 ±0.54	11.5 ±1.43	0.001
K^+ excretion rate (µEq/min/kg)	0.7 ±0.21	1.11 ±0.12	0.057
GFR (ml/min/kg)	0.20 ±0.04	2.76 ±0.44	0.04
%Na^+ Reabsorption of filtered load	88.5 ±2.15	96.7 ±0.5	0.087

* MC: *Matricaria chamomilla,* GFR: Glomerular filtration rate.

Effects of *M. chamomilla* decoction (15%) on urinary sodium, potassium and creatinine concentration in normal rats.

Urinary Na^+ concentration of rats treated with *M. chamomilla* decoction was increased significantly in comparison to normal rats who did not receive, while urinary K^+ concentration was slightly and non-significantly decreased (Table 3). Urinary creatinin concentration was significantly increased in *M. chamomilla* treated rats compared to the non-treated rats (Table 3).

Table 3. Effects of *M. chamomilla* decoction (15%) on urinary electrolytes and creatinine concentrations in normal rats.

Parameters	Normal Rats (n=6)	Normal Rats/MC (n=6)	P value
Urinary Na^+ (mEq/L)	200.16 ±17.93	327.16 ±16.81	0.008
Urinary K^+ (mEq/L)	46.36 ±12.5	32.16 ±0.6	0.299
Urinary Cr. (mg/dl)	8.27 ±1.06	44.16 ±2.3	0.000

*MC: *Matricaria chamomilla*.

Effects of *M. chamomilla* decoction (15%) on serum electrolytes and serum urea and creatinine concentration in normal rats.

Serum sodium (Na^+) concentration of normal rats treated with *M. chamomilla* was slightly and non-significantly decreased, whereas serum potassium (K^+) level was significantly increased, (Table 4). Daily administration of *M. Chamomilla* had no significant effect on serum creatinine (S. Cr.) and serum urea concentrations in normal rats (Table 4).

Table 4. Effects of *M. chamomilla* decoction (15%) on serum electrolytes and serum urea and creatinine concentration in normal rats.

Parameters	Normal rats (n=6)	Normal rats/ MC (n=6)	P value
S. Na^+ (mEq/L)	142.3 ±0.84	138.5 ±2.04	0.279
S. K^+ (mEq/L)	4.28 ±0.09	6.4 ±0.397	0.022
S. Cr. (mg/dl)	0.6 ±0.44	0.58 ±0.65	0.28
S. Urea (mg/dl)	43.5 ±3.33	20.3 ±2.29	0.423

* MC: *Matricaria chamomilla.*

Effects of *M. chamomilla* decoction (15%) and CLTD (5 mg/kg) on blood pressure and heart rate in hypertensive rats.

Matricaria Chamomilla decoction did not reduce blood pressure of hypertensive rats, but it significantly reduced the heart rate. Whereas chlorthalidone could significantly decrease both blood pressure and heart rate of hypertensive rats (Table 5).

Table 5. Effects of *M. chamomilla* decoction (15%) and CLTD (5mg/kg) on blood pressure and heart rate in hypertensive rats.

Parameters	Hypertensive Rats (n=6)	Hypertensive/MC (n=6)	Hypertensive/CLTD (n=6)
Blood Pressure (mm.Hg)	121 ±1.86 a	123±3.79 a	107± 1.83 b
Heart Rate (bpm)	407 ±11.66 a	355 ±10.87 b	337 ±11.54 b

MC: *Matricaria Chamomilla*. CLTD: Chlorthalidone.

Effects of *M. chamomilla* decoction (15% W/V) and CLTD (5 mg/kg) on urine flow, sodium excretion rate, potassium excretion rate, GFR and % Na^+ reabsorption of filtered load in hypertensive rats.

Urine flow of hypertensive rats receiving 15% decoction of *M. chamomilla* was slightly and non-significantly increased. Whereas in hypertensive rats that received chlorthalidone, urine flow was significantly increased (Table 6,).

Urinary sodium and potassium excretion rates of the hypertensive rats receiving *M. chamomilla* decoction was non-significantly changed, while CLTD significantly increased both urinary sodium and potassium excretion rates in hypertensive rats. (Table 6). Glomerular filtration rate in hypertensive rats receiving *M. chamomilla* or chlorthalidone was non-significantly changed, as shown in Table (3.6). Furthermore, both *M. chamomilla* and chlorthalidone had no detectable effects on % Na^+ reabsorption of filtered load in the hypertensive rats Table (6).

Table 6. Effects of *M. chamomilla* decoction (15%) and CLTD (5 mg/kg) on urine flow, sodium excretion rate, potassium excretion rate, GFR and % Na^+ reabsorption of filtered load in hypertensive rats.

Parameters	Hypertensive rats (n=6)	Hypertensive/ MC (n=6)	Hypertensive/ CLTD (n=6)
Urine flow (ml/min/kg)	0.0283± 0.0044 a	0.0316± 0.0043 a	0.055 ± 0.0073 b
Na^+ excretion rate (μEq/min/kg)	9.2±1.69 a	9.26 ±1.42 a	16.5 ±2.15 b
K^+ excretion rate (μEq/min/kg)	0.74 ±0.14 a	0.958± 0.13 a	1.66±0.18 b
GFR (ml/min/kg)	0.99 ±0.18 a	2.24 ±0.5 a	2.2 ±0.7 a
% Na^+ reabsorption of filtered load	93.56 ±0.59 a	95.59±1.37 a	91.96 ± 1.6 a

MC: *Matricaria chamomilla*. CLTD: Chlorthalidone, GFR: glomerular filtration rate.

Effects of *M. chamomilla* decoction (15%) and CLTD (5mg/kg) on urinary sodium, potassium and creatinine concentration in hypertensive rats.

Urinary Na^+ concentration of hypertensive rats treated with *M. chamomilla* or chlorthalidone were non-significantly changed. Table (7). Whereas, urinary K^+ concentrations of the hypertensive rats received chamomile or chlorthalidone were slightly and significantly increased Table. (7).

Urinary creatinin concentration in hypertensive rats that received *M. chamomilla* decoction or chlorthalidone were significantly higher than that of non-treated group. Table (7).

Table 7. The effects of *M. chamomilla* decoction (15%) and CLTD (5 mg/kg) on urinary electrolytes and creatinin concentration in hypertensive rats.

Parameters	Hypertensive Rats (n=6)	Hypertensive/MC (n=6)	Hypertensive/CLTD (n=6)
Urinary Na^+ (mEq/L)	319.83±14 a	290 ±9.29 a	300 ±5.73 a
Urinary K^+ (mEq/L)	26 ±1.8 a	30.3 ±0.88 b	30.6 ±1.02 b
Urinary Cr. (mg/dl)	22 ±1.77 a	60 ±9.7 b	39 ±10.27 ab

Effects of *M. chamomilla* decoction (15%) and CLTD (5 mg/kg) on serum electrolytes and serum urea and creatinine concentration in hypertensive rats.

Serum Na^+ concentrations of hypertensive rats treated with *M. chamomilla* and chlorthalidone were significantly lower than non-treated hypertensive rats. Table (8).

Serum K^+ concentration of the hypertensive rats received *M. chamomilla* was significantly increased, but in chlorthalidone treated rats, serum potassium concentration non significantly has been changed (Table 8).

Serum Creatinine concentration in hypertensive rats that received *M. chamomilla* decoction was non-significantly higher than the non-treated group. While in hypertensive rats receiving chlorthalidone, serum creatinine was significantly higher than the non-treated group (Table 8).

Serum urea concentration in hypertensive rats treated with *M. chamomilla* was non- significantly increased, whereas in chlorthalidone treated group the serum urea concentration was increased significantly (Table 8).

Table 8. Effects of *M. chamomilla* decoction (15%) and CLTD (5mg/kg) on serum electrolytes and serum urea and creatinine concentration in hypertensive rats.

Parameters	Hypertensive Rats (n=6)	Hypertensive/MC (n=6)	Hypertensive/CLTD (n=6)
S. Na^+ (mEq/L)	146.5 ±0.88 a	135 ±2.65 b	135.8± 0.54 b
S. K^+ (mEq/L)	3.85 ±0.07 a	5.38 ±0.43 b	3.98 ± 0.08 a
S. Cr. (mg/dl)	0.63±0.016 a	0.96±0.2 ab	1.11± 0.17 b
S. Urea (mg/dl)	20 ±0.83 a	35± 6.8 a	40.83 ±6 b

*MC: *Matricaria chamomilla*. CLTD: Chlorthalidone.

Figure 3.12 Effect of *M. chamomilla* decoction (15%) and CLTD (5mg/kg) on serum sodium concentration in hypertensive rats.

Discussion.

In this experimental animal model, normal and hypertensive rats were used in order to investigate the effects of *M. chamomilla* and CTLD on the measured parameters for instance total urine volume, urine and serum electrolytes concentration, and urinary potassium and sodium excretion rate.

In this study urine flow of normal rats significantly increased after receiving 15% *M. chamomilla*. This increase in urine flow by this plant decoction could be linked to a number of possible mechanisms, it might be because of inhibition of sodium reabsorption, hence urinary sodium concentration and urinary excretion rate of sodium is increased significantly, however it is not related to the inhibition of antidiuretic hormone [12], as urine Na^+ concentration and excretion rate were increased significantly. Therefore, it can be suggested that the diuretic effect of *M. chamomilla* is saluretic type, which indicates that the plant decoction has inhibited sodium reabsorption from the renal tubules

In this study, glomerular filtration rate of normal rats receiving *M. chamomilla* was significantly increased. This effect could be related to blocking of adenosine (A1) receptor, like theophylline, therefore it increases urine output through increasing GFR and blocking NaCl reabsorption in the proximal tubule and collecting duct [13 14].

Moreover, this rise in GFR induced by *M. chamomilla* decoction could be related to active substances which may dilate afferent renal arterioles as do many calcium channel antagonists for example nifedipine, nicardipine, and verapamil [15], or constricting renal efferent arterioles, In the

efferent arteriole, Ang II appears to stimulate Ca^{2+} entry via store-operated Ca^{2+} influx (Loutzenhiser and Loutzenhiser, 2000), resulting in an increase in GFR (Hall, 2011).

In the present study, *M. chamomilla* decoction (15%) non significantly increased the percentage of sodium reabsorption of filtered load of normal rats, because of increased sodium filtration as a result of increased GFR.

Serum sodium concentration was not significantly changed as plasma concentration of Na^+ should remain constant due to effect of various hormones and enzymes, and because of osmotic properties of plasma, as plasma osmolality is determined by plasma sodium [16].

In normal rats that administered *M. chamomilla* decoction urinary excretion rate of potassium was non-significantly increased, due to the rise in urine flow, but their urinary potassium concentration was non-significantly decreased. This indicates that *M. chamomilla* constituents increase sodium excretion more than potassium. On the other hand, *M. chamomilla* decoction significantly increased serum potassium concentration of normal rats, that it could cause hyperkalemia.

This diuretic activity of *M. chamomilla* is not attributed to blocking of aldosterone secretion because this plant and unlike spironolactone [17], its diuretic activity was appeared after two hours. While the aldosterone antagonist's diuretic effect usually appears after longer time, because they compete aldosterone for mineralocorticoid receptor, which is an intracellular receptor of the nuclear receptor family located in the kidneys, it modulates DNA transcription, causing synthesis of protein mediators as the mechanism of gene transcription, thereby inhibiting distal Na^+ retention and K^+ secretion [18].

This increase in serum potassium indicates that the diuretic effect of *M. chamomilla* does not resemble the action of the loop diuretic, such as furosemide, which acts in the thick ascending limb of loop of Henle where it acts by inhibiting the $Na^+/K^+/2Cl^-$ co-transport carrier in the luminal membrane, in which it increases the urine output followed by increased urinary excretion of electrolytes, mainly Na^+, K^+, and Cl^- (HL *et al.*, 2015). Therefore, it can be suggested that the diuretic activity of extract could be resemble the directly acting potassium-sparing diuretics such as amiloride and triametrene (Tamargo *et al.*, 2014), as they act on the late distal tubules and collecting ducts, inhibiting Na^+ reabsorption by blocking luminal sodium channels and decreasing K^+ excretion [19]. This could be related to high flavonoids content, that's similar to potassium sparing diuretics [20].

In the current study, blood urea and serum creatinine of normal rats administered chamomile decoction were non-significantly decreased. Whereas urine creatinine concentration was significantly increased. These indicate that *M. chamomilla* extract is safe in renal diseases and has beneficial effects on kidney function (Schneider *et al.*, 2016).

Studies that have done in last decades on plants to investigate their diuretic activity have demonstrated that diuretic effect of the plants could be attributed to several compounds such as

flavonoids, saponins or organic acids, [21]. There is a relationship between the presence of these polar secondary metabolites and their diuretic activity, which can produce diuresis they could have contact with renal tissues [22].

There are several mechanisms that contribute to the hypertensive effect of dietary salt, including water and salt retention, vascular abnormalities, and/or neurogenically mediated increases in peripheral resistance [23]. There are sequential steps by which salt intake influences arterial blood pressure. They include an effect on plasma sodium concentration and extracellular fluid volume (ECF). The greater rise in plasma sodium of sodium loaded rats, is due to a defect in the kidney's ability to excrete salt and to regulate extracellular fluid volume [24].

In the current study, urine flow of hypertensive rats receiving 15% *M. chamomilla* decoction was non-significantly increased. Which indicates that chamomile may have mild diuretic activity? In hypertensive rats that received chlorthalidone, urine flow was significantly increased as a result of increased water and sodium excretion rate, because it is a benzothiazide, which is a diuretic that exerts its action by blocking the Na^+ –Cl^- cotransporter in the luminal membrane of the distal convoluted tubule leading to a modest natriuresis and diuresis respectively[25]. However, urinary sodium concentration of hypertensive rats received *M. chamomilla* or chlorthalidone was non-significantly decreased.

In this study, GFR of hypertensive rats that received *M. chamomilla* decoction or CLTD, was non-significantly increased. Neither chamomile nor chlorthalidone had detectable effect on the percentage of reabsorbed sodium of filtered load.

In this study hypertensive rats received CLTD or *M. chamomilla* decoction significantly decreased serum sodium concentration. Because hyponatremia is seen within the first weeks of the start of chlorthalidone treatment (Liamis *et al.*, 2016), this effect is related to inhibition of sodium reabsorption in the renal tubules.

In addition to hyponatremia, hypokalemia was seen in CLTD treated hypertensive rats, and this thiazide-induced hypokalemia is related to the delivery of large amount of Na^+ in the late distal tubule and collecting duct and this promotes a transcellular exchange (transcellular shift) between K^+ and Na^+ as chlorothiazides inhibit sodium reabsorption only in distal tubules[26].

In the current study, urinary creatinine concentration of hypertensive rats received *M. chamomilla* decoction was significantly increased. However, their serum creatinine and serum urea have not been changed significantly. This indicates that *M. chamomilla* is safe during renal disorders [27]. Serum creatinine and blood urea of hypertensive rats treated with chlorthalidone were slightly significantly increased but it was within normal range.

In this study unlike chlorthalidone, administration of *M. chamomilla* had no significant effect on blood pressure of neither normal nor hypertensive rats. As it possesses a mild diuretic activity, and could not counteract the hypertensive effects of sodium load. However, it significantly decreased HR of hypertensive rats. This decrease in heart rate has no effects on blood pressure, as heart rate and unlike to an increase in cardiac contractility, it has minimum effects on maintaining blood pressure[13]. This negative chronotropic effect of chamomile could be attributed to the direct effect of some its active constituents on SA node, like ivabradine which has been shown to have similar effects on HR in other species including rabbits, rats, dogs, and human

Conclusion: Chamomile has mild diuretic activity in normal rats and its effects resemble that of potassium sparing diuretics.

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