

## **Morphometrical, Histochemical and Electrophysiological Changes in Peripheral Neuropathy of Diabetic Patients**

**Name:** Payman Jamal Muhamad Ameen

**Nature of the research:** Academy

**Degree:** Ph.D.

**Specialty:** Anatomy

**Date the discussion:** 24-12-2009

**Supervisor:** Asst Prof. Talib Jwad Kathem  
Prof. Hiwa Bakir Banna

### **Abstract**

The present work designed to study the structural and immunohistochemical changes of the peripheral (common peroneal and tibial,) nerves and the popliteal artery by means of teasing nerve fiber and histological sections in amputated legs taken from 30 diabetic patients (8 females and 22 males), age (55-75) years and 30 cadavers (4 females and 26 males), age (25-50) years as control group, with the support of the Electrophysiological examinations of 120 volunteers (60 diabetics and 60 non diabetic), age (35-55) years. The results of teased nerve fibers of the diabetic group showed segmental demyelination, Paranodal swelling and short segments, while that of the histological sections of the nerves showed a significant decrease in the number of the nerve fibers, with a significant reduction in their diameter and myelin thickness in both above mentioned nerves. It was appeared that the number of the nerve fibers decreased moderately with progress of age and duration of the diabetic period in both nerves. The multiple regression analysis showed significant effect, of age, male gender and duration of diabetes on the development of neuropathy. The protein S100 was significantly depleted in both nerves from diabetics, such observation appeared more pronounced in the tibial nerve. The male gender, age progression and to a lesser extent the duration of the disease observed to be risk factors aggravating the depletion of the S100 protein. Histological sections from the popliteal artery of diabetic patients, showed marked decrease in the diameter of the lumen, reduced thickness of tunica media with a considerable increase in the thickness of tunica intima which represented by the increased thickness of the basement membrane, while the thickness of adventitia was not affected. The loss of endothelium in some places, cellular infiltrations, and in more severe cases calcifications, organized thrombus and Periodic acid Schiff positive particles were also detected. The multiple regression analysis, showed significant effect of duration of diabetes on the diameter of the lumen, and thickness of the wall and the tunica intima of the popliteal artery. Electrophysiological examinations showed significant increase in motor latency with significant decrease in the velocity of both the common peroneal and tibial nerves compared to the control subjects. There was a weak correlation coefficient between body mass index and duration of diabetes with the motor nerve conduction..Using multiple regression analysis age had no effect when diabetes included and no effect of gender when height and age included. The present study concluded that neurological and vascular factors were simultaneously responsible for the pathogenesis of diabetic

peripheral neuropathy, and the age, male gender and a lesser extent the diabetic period and height may act as risk factors.

# **Estimation of the Cardiac Hormone NT-ProBNP and hsCRP in End Stage Renal Disease Patients and their Significance as Clinical Biomarkers.**

**Name:** Sherwan Rahman Sulaiman

**Nature of the research:** Academy

**Degree:** Ph.D.

**Specialty:** Medical Physiology.

**Date the discussion:** 24-12-2009

**Supervisor:** Professor. Salahaddin M. Al-Merani

## **Abstract**

The correlation among heart, kidneys and the endocrine system is well known and complicated. The cardiac hormone NT-ProBNP and the inflammatory protein hsCRP have emerged as novel cardiac and renal biomarkers.

This study was designed to investigate these relations through estimation of plasma levels of N (Amino) terminal Pro-Natriuretic Peptide (NT-ProBNP) and high sensitive C Reactive Protein (hsCRP) in End Stage Renal Disease (ESRD) patients undergoing low flux hemodialysis (Lfx HD) and Peritoneal Dialysis (PD). Blood samples of ESRD patients with and without heart failure (HF) were taken before and after Lfx HD and PD for measurements of these biomarkers. The values are expressed as mean  $\pm$  SD.

In this study, a total of 50 ESRD patients, 26 males and 24 females, aged 13 to 75 years, were selected among all cases attending dialysis unit in Halwer Teaching Hospital during the period of 1st Oct 2008 till the end of February 2009.

The estimated levels of NT-ProBNP and hsCRP in ESRD patients were already significantly high before Lfx HD and PD when compared to controls. Lfx HD and PD induced significant increases in the plasma levels of NT-ProBNT (from  $775 \pm 306$  to  $1127 \pm 308$ ) fmol/ml and (from  $988.5 \pm 326.6$  to  $1177.6 \pm 202.5$ ) fmol/ml respectively. There was a strong negative correlation between NT-ProBNP with estimated Glomerular Filtration rate (eGFR) ( $r = - 0.81$ ) and PCV ( $r = - 0.85$ ) which were statistically highly significant ( $P < 0.001$ ). Plasma level of NT-ProBNP showed a statistically highly significant strong positive correlation with the level of hsCRP ( $r = 0.73$ ).

A statistically highly significant increase was found between pre and post Lfx HD samples of hsCRP (from  $80 \pm 46$  to  $145 \pm 55$ ) mg/L. A similar increase was obtained with PD (from  $112 \pm 38$  to  $138 \pm 37$ ) mg/L which is statistically significant ( $P < 0.01$ ). The correlation of hsCRP with each of eGFR ( $r = - 0.661$ ) and PCV ( $r = - 0.687$ ) is strong and highly statistically significant.

It is concluded that the high levels of NT-ProBNP and hsCRP in ESRD patients are significant and valuable biomarkers. Both are correlated strongly with each other and with eGFR. This is statistically and clinically highly significant.

# **Histological, Immunocytochemical and Biochemical study of the effects of Rheum ribes and Adiantum capillus on alloxan induced diabetic rats**

**Name:** Afrah Hameed Sultan

**Nature of the research:** Academy

**Degree:** Ph.D.

**Specialty:** Histology

**Date the discussion:** 24-12-2009

**Supervisor:** Prof. Hiwa Bakir Banna  
Asst prof. Kawa F. Dizay

## **Abstract**

The present study was designed to investigate the hypoglycemic effect of aqueous extract of two local herbs *Rheum ribes* (200mg/kg) and *Adiantum capillus* (100mg/kg) given once daily to rats. The animals were divided into diabetic and non-diabetic normal groups. The duration of each experiment lasted in two weeks up to one month, and the results were compared with that of the standard hypoglycemic drug Metformin (100mg/kg), given once daily. In this study biochemical, histochemical and immunohistochemical techniques were used in alloxan (single intraperitoneal injection 100 mg/kg) induced diabetic male rats.

The diabetic rats showed a significant ( $p < 0.05$ ) decrease in their body weight and serum amylase with marked elevation in blood glucose level, serum cholesterol, triglycerides, urea, alkaline phosphatase (ALP), and serum transaminases (AST and ALT) during two weeks till one month of diabetic duration. Histological examination of the pancreas of diabetic rats revealed a significant increase in the thickness of basement membrane of the blood vessels and capillaries in islet of langerhans, as well as decreased activity of Beta-cells and increase activity of (Alpha, Delta cells) using both Gomri Aldehyde Fuchsin (GAF) and Immunohistochemistry (IHC) techniques, while in the kidney the results showed increased thickness of capillary's basement membrane in the glomerulus, and tubule's basement membrane and PAS +ve granules in distal convoluted tubule cells. In the liver tissue a marked increase in the PAS +ve granules inside hepatocytes was observed.

Administration of aqueous extract of either *Rheum ribes* (200mg/kg) and *Adiantum capillus* (100mg/kg) caused dramatic changes in all parameters measured in this study which include; an increase in the body weight and serum amylase, and lowering the level of blood glucose, serum cholesterol, triglycerides, urea, alkaline phosphates (ALP), and serum transaminases (AST and ALT) in comparison to the diabetic group. These results were compared to the results obtained from the use of hypoglycemic drug Metformin in all parameters in this study.

Finally, it was concluded that administration of these plants reversed most changes caused by the induction of diabetes in rats by alloxan in the tissues studied.

## **Histological Changes in Experimentally Induced Gastric Ulcer Treatment with Animal Charcoal, Marshmallow and Pine Nut Oil**

**Name:** Awring Mahmood Ahmed

**Nature of the research:** Academy

**Degree:** Ph.D.

**Specialty:** Histology

**Date the discussion:** 22-12-2009

**Supervisor:** Prof. Kameel M. Naom

Prof. Hiwa Bakir Banna

### **Abstract**

The aim of this study is first to assess the effect of hot pepper on the gastric mucosa and compare it with ulcer induced by aspirin and local application of acetic acid. Second to find out the curative effects of animal charcoal, marshmallow and pine nut oil on ulcer lesions in the stomach. Third to detect carbohydrates or sugars in gastric mucosa before and after induction of ulcer using lectins conjugated with fluorescence isothiocyanate.

In this study the experimental mice weighing 20-30 g were fasted for 18 hours. For induction of stomach ulcer with aqueous extract of hot pepper, the animals were divided into three groups with six animals in each group. The first group received distilled water and served as a negative control. The second group received 300mg/kg of body weight aspirin orally and served as a positive control. The third group received 1.8g/ kg of body weight aqueous extract of hot pepper.

Similar experiments were carried out for the induction of stomach ulcer but with alcoholic extract of hot pepper. Other experiments carried out for the treatment of stomach ulcer induced by aqueous extract of hot pepper using aqueous and alcoholic extract of animal charcoal, marshmallow and pine nut oil.

The results showed that both aqueous and alcoholic extract of hot pepper were a strong ulcerogenic factors for producing lesions in the gastric mucosa. The activity of aspirin was similar to the activities of both aqueous and alcoholic extract of hot pepper. The results also showed that topical application of aqueous extract of hot pepper on surface of gastric mucosa in mice was similar in activity with acetic acid. Macroscopically the ulcers showed elongated rounded lesion on the luminal surface of mouse stomach. Microscopically, the surface epithelium shows congestion, mucosal inflammatory cell infiltration and cellular debris and disruption of surface epithelium. The results also showed that number of parietal cells on the gastric mucosa was increased after induction of ulcer with hot pepper, while the number of chief cells was decreased. The length of gastric pits and glands were not changed significantly after induction of ulcer.

In this study, after induction of ulcer, mice received pine nut oil for one week showed only few inflammatory cells with some extent of mucosal regeneration, but after two weeks of treatment these animals showed complete clearance of inflammatory cells and almost complete recovery of surface epithelium. Mice received aqueous and alcoholic extraction of marshmallow for 10 days after induction of ulcer showed

significantly improved mucosal damage. Mice received suspension of aqueous and alcoholic extract of animal charcoal almost showed complete clearance of inflammatory cells.

In this study also Alcian blue/ Periodic acid Schiff methods were used for detection of mucin containing cells. The results showed depletion of mucin in the surface mucous in mice treated with hot pepper.

The binding of three Flouresceinisothiocyanate- lectins: Concanavalin A, Wheat germ agglutinin and Peanut agglutinin with different specificities was studied to demonstrate structural differences in the glycoprotein composition of various cell types of the normal and ulcerated gastric mucosa in the mice. The results showed that all lectins reacted differentially with the various components of the gastric mucosa either before or after induction of ulcer. The highest reaction was shown with Wheat germ agglutinin.

# **Histological, Histochemical and Biochemical Studies on the Effects of Two local Herbs on the Male Reproductive System of Induced Diabetic Rats**

**Name:** Hero Khalid Mustafa

**Nature of the research:** Academy

**Degree:** Ph.D.

**Specialty:** Histology

**Date the discussion:** 24-12-2009

**Supervisor:** Prof. Hiwa Bakir Banna

Asst Prof. Talib Jwad Kathem

## **Abstract**

The present study was designed to investigate the hypoglycaemic effects of aqueous extract of two local herbs *Cymbopogon citratus* (100 mg/kg) and Olive leaves (100 mg/kg) once daily, in which the animals were divided into diabetic and non-diabetic normal groups. The duration of the experiment lasted from one to five months after which the results were compared with that of a standard hypoglycaemic drug Glibenclamide (0.6 mg/kg) once daily. In this study a histological, histochemical, immunohistochemical and biochemical techniques were used.

Diabetes was induced by a single intraperitoneal injection of alloxan in a dose of (90 mg / kg). Diabetic animals showed a significant ( $p < 0.05$ ) decrease in their body weights and serum testosterone hormone with marked elevation in blood glucose level during the time of experiment. Histological examination of the testes of diabetic rats revealed a significant increase in the thickness of basement membrane of both the seminiferous tubules and arterioles with increased (periodic acid Schiff) PAS positive particles in both seminiferous tubules and Leydig cells, also the results showed a significant decrease in diameter of seminiferous tubules, number of cell layers and maturation index in addition to degenerative changes and decline in the number of spermatogenic cells during diabetic duration in comparisons to normal groups. With an increase in the thickness of basement membrane of both epithelial and arteriole in both prostate and seminal vesicles as well as (periodic acid Schiff) PAS positive particles in prostate gland. Also significant increase was obtained in the localization of (glucose transporter 3) GLUT3 protein in diabetic testis in all age groups with significant decrease in both (glucose transporter 8) GLUT8 protein in (testes and prostate) and testosterone localization in testes in all age groups in comparisons with normal groups.

The administration of aqueous extract of both *Cymbopogon citratus* and Olive leaves caused dramatic changes in all parameters used in this study which include; weight gain, lowering the level of blood glucose near to normal with an increase in the serum testosterone.

These results were compared to the results obtained from the use of a known hypoglycaemic drug glibenclamide in all parameters used in this project.

In brief the two herbs used in this study increase the peripheral uptake of glucose, increase number of spermatogenic cells and an increase in (glucose transporter 8) GLUT8 protein with decrease in (glucose transporter 3) GLUT3 protein, therefore one

can conclude that these two herbs might be used for the minimized the disorder of male reproductive during diabetes.

# **Estimation and Evaluation of Some Biophysical Parameters in B-Thalassaemia Patients in Erbil City**

**Name:** Dhahir Tahir Ahmad

**Degree:** Ph.D.

**Specialty:** Biophysics

**Date of the debate:** 2009

**Supervisor:** Assist. Prof. Amir D. Al-Dabbagh  
Assist. Prof. Salah Abubakr Ali

## **Abstract**

Thalassaemia is an inherited hematological disease caused by decrease or absence of production of  $\alpha$  or  $\beta$ -globin chains of hemoglobin and characterized by many changes in red blood cell morphology, plasma constituents and clinical sequels. Viscosity is a properties of a fluid related to the internal frictional of adjacent fluid layer against laminar flow, as well as the friction of the fluid generated between molecules and layers a tendency resistance to flow. Blood in this respect is regarded as a non Newtonian fluid.

For estimation and evaluation of some biophysical parameters in thalassaemia patients in Erbil city, a total of ( 214) subjects participated in the this study,(147) patients were with thalassaemia major,(25) with thalassaemic minor , who were attending thalassaemia center in Erbil city. The control group included (42) apparently healthy subjects, the study started in 3rd of January 2008.

The results of this study, showed that there was a significance differences between thalassaemia major patients and control group regarding : weight, height, saturated pressure of oxygen, HCT, plasma viscosity, blood viscosity, blood conductivity, C-reactive protein red blood cell charge, WBC, Hb concentration, ESRs, blood density, kinematical viscosity and relative viscosity.

While in thalassaemia minor patients, there were significant differences from normal control group, regarding the following parameters: plasma viscosity, blood conductivity, C-reactive protein, red blood cell charge, white blood cell count, saturated pressure of oxygen and kinematical viscosity.

The present study also showed that blood viscosity changes exponentially with changes in temperature, so that the viscosity decreases when temperature increases and vice versa in all the three study groups.

This study showed a strong positive relationship between blood viscosity and hemoglobin concentration, white blood cell counts, red blood cell counts, hematocrit, platelet counts.

However, this positive relationship was stronger between plasma viscosity and white blood cell count, blood density, white blood cell count, and C-reactive protein in thalassaemia major patients.

While, the relative between zeta potential, red blood cell charge, relative viscosity, blood conductivity, and kinematical viscosity were inversely related to blood viscosity. There were not previously studied by any researcher.

## **A comparative study of the immunological effects of two different medical regimens on the breast cancer**

**Name:** Shireen Ahmed Sulayman

**Nature of the research:** Academy

**Degree:** Ph.D.

**Specialty:** Immunology

**Date the discussion:** 10-2-2010

**Supervisor:** Asst Prof. Nabeel E. Waheda

### **Abstract**

A total of 110 subjects were enrolled in this study. Ninety patients with different stage of breast cancer after mastectomy were attended Rizgary teaching hospital and Nanakaly hospital from the period of (January 2008 to July 2009) were included in this study and 20 healthy individual also included in this study as a control group(C). In this study many immunological, hematological and virological parameters were evaluated, starting with patient after mastectomy (M) not subjected to any chemo- or radiotherapy), patients after 3 cycle (a) and patients at the end of 6 cycle (b) of chemotherapy treatment ( each cycle

lasted 21 days) using protocol CAF (A) and protocol TAC (B) for treatment, 22 patients treated by protocol A and 18 patients treated with protocol B.

The results of this study showed obvious relation between risk factors and development of breast cancer, among these factors is the age, it revealed that the most frequent age for breast cancer was that at age range group 40-49 when compared with age 20-29 year.

The higher frequency of breast cancer was found in patients with no family history of cancer when compared with those having family history of cancer. The result showed that the number of patients with body mass index (BMI >25 kg/m<sup>2</sup>) was higher when compared with number of patients having body mass index (19-25 and <18 kg/m<sup>2</sup>) respectively. A positive significant relation was found between patients starting age menarche at (12 and 13 year) and developing breast cancer when compared with the patient starting age menarche at (14 and 15-16 year) respectively. Concerning relation of breast cancer with age of patients whom delivered first child showed that among 81 patients at age range of 14- 21 and 22-29 year respectively, breast cancer were higher when compared with the number of patients delivered first child at age range groups (30-37 and 38-45) year respectively.

The risk of developing breast cancer in this study found were lower in patients who give birth to (7-9 and 10-12) child respectively when compared with the patients whom born (1-3 ) child. The higher frequency of breast cancer was found in patients feeding their babies by bottle when compared with the patients feeding their babies naturally. The number of the patients diagnosed as stage III (A, B and C) and stage II were higher when compared with the number of the patients diagnosed as stage I and IV, in addition to that the number of the patients who diagnosed as T3N2M0 were (16) . There was a marked decrease in the mean total WBC count (x10<sup>3</sup>/cu mm), total platelets count (Pltx10<sup>3</sup>/cu mm), mean concentration of hemoglobin (Hb. g/dl) and mean value of hematocrit (%) in PB of the (b) patients when compared to their mean total count and value in PB of (M)

patients using "protocol A and B" chemotherapy. A significant increase was observed in the mean concentration of IL-10 in sera of the (M) patients in comparison with its mean concentration in sera of (C) group and (b) patients using "protocol A and B" ( $p < 0.05$ ). No significant difference was observed in the mean concentration of TNF- in sera of the (M) patients when compared with its mean concentration in sera of (a) and (b) patients using "protocol A and B". A highly significant increase was found in mean concentration of TNF- in serum of (M) patients when compared with its mean concentration in sera of (C) group. A highly significant decrease was found in the mean level of CA 15-3 in sera of the (b) patients in comparison with its mean level in (M) patients using "protocol A and B". No significant difference in the mean concentration of serum complement C3 was observed in (M, a and b) patients while a highly increase was found when compared with control group. Also a significant decrease was found in the mean concentration of C4 in sera of (b) patients when compared to its mean concentration of (M) patients using protocol A ( $P < 0.05$ ). A highly significant decrease was found in sera of (b) patients using protocol B ( $P < 0.001$ ). A significant reduction in the mean value of IgG (mg/dl) in sera of (b) patients was observed when compared with its mean value in sera of (M) patients using "protocol A" ( $p < 0.05$ ), but no significant difference was found in the mean value of IgG in sera of different groups when using "protocol B". ( $P > 0.05$ ).

There was no significant difference in the mean value of IgM (mg/dl) in sera of the (M) patients when compared with its mean concentration in sera of (a) and (b) patients using "protocol A and B" ( $p < 0.05$ ). A significant decrease in the mean value of IgA (mg/dl) in sera of the (b) patients was detected in comparison with its mean value in sera of (M) patients using "protocol A and B" ( $p < 0.05$ ). Out of 90, 20 patients only showed a positive (sHER-2) with mean serum concentration (17.69 ng/dl) which was higher when compared with the mean concentration of (sHER-2) in sera of control group (4 ng/dl) ( $p < 0.001$ ). The number and percentage of the patients with positive result of serum showed no correlation between EBV and breast cancer.

## **Evaluation of 5'Nucleotides Enzyme Activity and some other Related Parameters in Rheumatoid Arthritis**

**Name:** Sardar Nouri Ahmed

**Nature of the research:** Academy

**Degree:** Ph.D.

**Specialty:** Biochemistry

**Date the discussion:** 28-1-2010

**Supervisor:** Asset prof.. Tayfoor J. Mahmoud  
Professor. Hamid G. Hassan

### **Abstract**

The analytical procedures of this research project were carried out during the period between March 2008 and April 2009. The study included: Determination of serum 5'nucleotidase activity, and its kinetic, and thermodynamic properties. Separation and identification of 5'nucleotidase isoenzymes. Estimation of serum: Alkaline phosphatase and Adenosine deaminase activities.

Determination of serum levels of: uric acid, malondialdehyde, total protein, albumin, and globulins. Evaluation of erythrocyte sedimentation rate value.

Blood specimens were obtained every day from RIZGARY and HAWLER Teaching Hospitals.

All enzyme activities and biochemical compound levels were measured using UV/VIS. Spectrophotometry in the research laboratory of Clinical Biochemistry/College of Medicine/Hawler Medical University.

The subjects of the present study comprised two groups:-

1- Group One: Consisted of 162 apparently healthy individuals

(115 females and 47 males), the average age was (39.04±8.6) years,

And the average body mass index (BMI) was (28.3±0.07Kg/m<sup>2</sup>).

2- Group Two: Consisted of 124 newly diagnosed or known rheumatoid Arthritis patients. (81 females and 43 males), the average age was

(38.03±9.6) years, and the average body mass index (BMI) was

(23.2±0.06Kg/m<sup>2</sup>).

The results obtained can be summarized as follows:-

The mean activity of serum 5'nucleotidase in rheumatoid arthritis (RA) patients was significantly higher than that of normal individuals.

The best optimum conditions for 5'nucleotidase activity; were T=37C<sup>0</sup>, pH=7.5, and substrate concentration=10mMol/L.

The ratio of females to males in rheumatoid arthritis patients was 2:1, the body mass index (BMI) in rheumatoid arthritis patients was significantly lower than that of normal group.

The ratio of hyper value of erythrocyte sedimentation rate in rheumatoid arthritis patients was 66.13%, while ratio of positive rheumatoid factor (+RF) was 70.16%, and positive C-reactive protein (+CRP) was 88.71%.

5- The results showed that procyanidine extract, adenosine, ATP, uric acid, theophylline, caffeine, nickel chloride, and zinc chloride were acting as 5' nucleotidase inhibitors, while phosphate salt, adenine, guanosine, magnesium sulphate and manganese chloride were act as activators.

6- Kinetic studies showed that, in rheumatoid arthritis patients, the constant Michaelis-Menten ( $K_m$ ) values for the serum 5' nucleotidase enzyme-substrate binding were decreased and the maximum velocity ( $V_{max}$ ) values were increased.

The forward reaction rate constants ( $K_1$ ) for 5'NT was increased in RA patients, whereas the half-life time ( $t_{1/2}$ ) of 5'NT was decreased.

8- The Hill coefficient ( $n$ ) revealed that there was a cooperation and significant change in ( $n$ ) values in rheumatoid arthritis patients compared with that of normal group.

9- The activation energy ( $E_a^*$ ) for 5'NT reactions was decreased in rheumatoid arthritis patients compared with normal individuals.

10- The  $\Delta H^*$ , and  $\Delta G^*$  values for 5' nucleotidase reactions in normal and rheumatoid arthritis groups were positive.

11- The  $\Delta S^*$  values for 5' nucleotidase reactions in normal and rheumatoid arthritis groups were negative.

12- Using ion exchange chromatography three isoenzymes of 5' nucleotidase were separated and identified in rheumatoid arthritis patients.

13- Electrophoretic analysis was carried out for serum rheumatoid arthritis and normal group. Scanning analysis showed extra peaks appearing on the electrophoretic support of the rheumatoid arthritis patients when compared with normal group.

14- The mean activity of serum adenosine deaminase in rheumatoid arthritis patients was significantly higher than that of normal individuals.

15- Serum alkaline phosphatase activity in rheumatoid arthritis patients was significantly higher than that of normal group.

16- The level of serum uric acid in rheumatoid arthritis patients was not changed compared with normal individuals.

17- The levels of serum malondialdehyde in rheumatoid arthritis patients was significantly higher than that of normal group.

18- There was not any significant difference in the levels of serum total protein between rheumatoid arthritis and normal group.

19- The level of serum albumin in rheumatoid arthritis patients was non significantly higher than that of normal individuals, while Serum globulins were none significantly lower than that of normal individuals.

20- The value of erythrocyte sedimentation rate in rheumatoid arthritis patients was significantly higher than that of normal group.

## **Some immunological and Biochemical Parameters in Patients Afflicted with Acute Leukemia before and after Induction Remission**

**Name:** Haween Toufiq Hasan

**Nature of the research:** Academy

**Degree:** Ph.D.

**Specialty:** Immunology

**Date the discussion:** 5-1-2010

**Supervisor:** Asset Prof. Nabeel E. Waheda

### **Abstract**

**Background and objectives:** Acute lymphoblastic leukemia (ALL) and acute myeloid leukemia (AML) have long been recognized to be clinically and morphologically heterogeneous. This study was designed to find out the immunological status of patients afflicted with ALL and AML at newly diagnosis and after complete induction remission by using different chemotherapy protocols.

**Materials and Methods:** This study was carried out in Erbil province during the period from March 2008 to February 2009. Ninety newly diagnosed patients with acute leukemia (40 with ALL and 50 with AML) were admitted to Nanakaly Hospital for Blood Diseases, and 25 healthy subjects as a control group had been included in this study.

**Results:** The commonest morphological subtype (FAB) of patients with ALL in this study was ALL-L1, whereas AML-M2 morphological subtype was more prevalent than other morphological subtypes.

Mean concentration of IL-10 were significantly higher (36.00, 39.14, 30.91 and 45.29 pg/mL) in sera of newly diagnosed patients including: child with ALL, adult ALL, AML except subtype-M3 and AML-M3), as compared to its concentration in sera of the same patients after CR (10.50, 17.86, 15.09 and 13.86 pg /mL) respectively, as well as to control group ( $P < 0.001$ ).

There were a highly significant elevation in the mean concentration of IFN- $\gamma$  (1.64, 1.86, 2.19 and 4.77 IU/mL) in sera of newly diagnosed patients including: child with ALL, adult ALL, AML except subtype-M3 and AML-M3 when compared to control group ( $P < 0.001$ ), as well as to its concentration in sera of the same patients after CR (0.50, 0.93, 0.46 and 0.43 IU/mL) respectively ( $P < 0.01$ ).

A highly significantly increased level of TNF- $\alpha$  were observed (56.66, 45.14, 55.36 and 56.43 pg/mL) in sera of newly diagnosed patient groups including: child with ALL, adult ALL, AML except subtype-M3 and AML-M3 , as compared to its concentration in sera of the same patients after CR (20.60, 20.71, 15.41 and 18.71 pg /mL) respectively, as well as to control group ( $P < 0.001$ ).

The mean concentration of CRP was significantly elevated (58.28, 67.28, 57.71 and 44.30 mg/L) in sera of newly diagnosed patients including: child with ALL, adult ALL, AML except subtype-M3 and AML-M3, as compared to its concentration in sera of the same patients after CR (7.59, 15.59, 10.61 and 8.78 mg/L) respectively, as well as to control group ( $P < 0.001$ ).

The mean LDH level was significantly higher (847.20, 786.57, 917.18 and 932.71 IU/L) in sera of newly diagnosed including: child with ALL, adult ALL, AML except subtype-M3 and AML-M3, as compared to control ( $P < 0.001$ ).

Conclusion: IL-10 and IFN- $\gamma$  are considered as an efficient immunological parameters for diagnosis and follow up of chemotherapy treatment in patients with acute leukemia. On the other hand, continuous increase in mean concentration of TNF- $\alpha$  especially in child patients with ALL before and after chemotherapy may be a cause for the relapse.

# **Sialic Acid as Possible Biomarkers in Sera of Acute Myocardial in Erbil City**

**Name:** Rasul Sulayman Aziz

**Nature of the research:** Academy

**Degree:** Ph.D.

**Specialty:** Biochemistry

**Date the discussion:** 1-4-2010

**Supervisor:** Asset prof. Tayfoor J. Mahmoud  
Professor. Hamid G. Hassan

## **Abstract**

The analytical procedures of this research project were carried out during the period between July/ 2008 and September /2009 the study included determination of:

1-Serum Total Sialic Acid (TSA)

2-Serum Lipid Associated sialic acid (LASA)

3-Serum Protein bound sialic acid (PBSA)

4- Glycoproteins which include (Seromuroid and protein bound hexose).

5- Serum total protein (TP).

6-Serum Total sialic acid/Total protein ratio (TSA/TP).

7-Serum lipid profiles which include (Total cholesterol, Triglycerides, high density Lipoprotein, low density lipoprotein and very low density lipoprotein)

8-Electrophoretic analysis was carried out for serum protein.

Blood specimen were obtained every day from patients at Coronary Care Units (CCU) in Hawler teaching Hospital.

All biochemical variables were measured by UV/Vis. Spectrophotometry in the research laboratory of Clinical Biochemistry/College of Medicine / Hawler Medical University.

The subjects of the present study comprised Two groups:-

1- Group One: Consisted of 100 apparently healthy individuals

(30 females and 70 males), the average age was (54.85±0.94) years, range of age was (35-76) years.

2- Group Two : Consisted of 100 newly diagnosed of acute myocardial infarction patients. (30 females and 70males), the average age was (59.38±1.02) years. 89% of male and 93% of Female ages are more than 45 years, range of age was (36-80) years .

The results obtained can be summarized as follows:-

The mean Levels of serum Total sialic acid in acute myocardial infarction patients were significantly higher than those of healthy controls.

Serum lipid associated sialic acid of acute myocardial infarction patients was significantly higher than those of healthy controls.

Serum Protein bound sialic acid of acute myocardial infarction patients was significantly higher than those of healthy controls.

4- Serum glycoprotins:

-Seromuroid and Protein bound hexose: The mean value of seromuroid

and Protein bound hexose in acute myocardial infarction patients were significantly higher than those of healthy controls.

- 5- There was not any significant difference in the level of serum total protein between the two groups.
- 6- The patients with acute myocardial infarction had significantly higher level of total cholesterol, triglycerides, low density lipoprotein and very low density lipoprotein levels but lower high density lipoprotein levels than those of healthy controls.
- 7- The mean level of Serum total sialic acid was positively correlated with lipid associated sialic acid, Protein bound sialic acid, Glycoproteins (Seromucoid and protein, bound hexose), Systolic, diastolic pressures and smoking in acute myocardial infarction patients.
- 8- There is no any significant difference of serum total sialic acid according to the gender and age in acute myocardial infarction patients.
- 9- As a result of the study, the acute myocardial infarction show a high prevalence with age of  $\geq 45$  years.
- 10- The correlation between sialic acid and total cholesterol, Triglycerides, high density lipoprotein, low density lipoprotein and very low density lipoprotein), in patients showed a significant positive correlation. Whereas the relation of sialic acid with high density lipoprotein showed a negative trend.
- 11- Electrophoretic analysis was carried out for serum protein of acute myocardial infarction patients and normal group. The scanning analysis showed extra peaks appearing on the electrophoretic support of acute myocardial infarction group when compared with normal group.

# **Histological, Glycohistochemical and Immunohistochemical studies of testes and Ovaries Following Inhalation of Mice to some Organic Solvents**

**Name:** Layla Abdul-Sattar Kareem

**Nature of the research:** Academy

**Degree:** Ph.D.

**Specialty:** Histology

**Date the discussion:** 13-12-2010

**Supervisor:** Prof. Hiwa Bakir Banna

Prof. Kameel M. Naom

## **Abstract**

The present study was designed to investigate the effects of toluene and formaldehyde inhalation on the testes and ovaries of adult mice. The mice divided into three groups, control group, toluene exposed and formaldehyde exposed groups. The male and female mice exposed to (3ml = 300ppm toluene) and (2.5ml = 300ppm formaldehyde) 3 hours daily for 21 days. In this study a histological, glycohistochemical and immunohistochemical techniques were used.

Male exposed to both solvents showed a significant decrease in their body weights at ( $p < 0.05$ ). Histological examination of the testes of exposed mice (either to toluene or formaldehyde) revealed an increase in the thickness of basement membrane of seminiferous tubules and a significant decrease in diameter of seminiferous tubules, number of spermatogenic layers, number of leydig cells and decline in the number of spermatogenic cells after inhalation in comparisons with the normal groups.

Regarding the Females, exposed animals also showed a significant decrease in their body weights at ( $p < 0.05$ ). Histological examination of the ovaries of exposed mice (either to toluene or formaldehyde) revealed an increase in the thickness of zona pellucida of ovarian follicles, a significant increase in the number of primary, secondary and graffian follicles with decrease in the number of primordial follicles after inhalation in comparisons to the normal groups.

Also a significant increase was obtained in the localization of (proliferating cell nuclear antigen) PCNA protein in the testes and ovaries of mice exposed either to toluene or formaldehyde in comparisons with the normal groups.

In this study, glycohistochemical technique applied by using different lectins conjugated with fluorescence isothiocyanate in order to detect carbohydrates or sugars in testes and ovaries tissues before and after inhalation of toluene and formaldehyde. These lectins are: Wheat germ agglutinin WGA, Lotus tetragonolobus agglutinin LTA, Ulex europheor agglutinin UEA and Lens culinaris agglutinin LCA with different specificities was studied to demonstrate structural differences in the glycoprotein composition of various tissues of the testes and ovaries before and after inhalation of both toluene and formaldehyde in the mice. The results showed that all lectins reacted differentially with the various components of the testes and ovaries either before or after inhalation of toluene and formaldehyde. The highest reaction was shown with Wheat germ agglutinin.

# **Prenatal Detection of Down Syndrome and Neural Tube Defects Among Pregnant Women In Erbil City**

**Name:** Sana Kamal Khidher

**Nature of the research:** Academy

**Degree:** Ph.D.

**Specialty:** Embryology

**Date the discussion:** 5-12-2010

**Supervisor:** Prof. Kameel M. Naom

Prof. Hiwa Bakir Banna

## **Abstract**

Having a baby can be the most joyous event in any family. Every parent wants their child to be healthy and to grow up and be free of anomalies. Thus, parents need to know how to prepare a healthy environment for their baby even before he or she is born. During the nine months of pregnancy, important development occurs that can affect the health of the baby for the rest of his/her life. That's why this is such a critical time to protect the unborn baby from harmful exposures. Learning the dangers inherent in our modern world can help mothers to avoid many of them and increase the chance of having a healthy baby. Most of mothers know that eating properly, getting enough of the right vitamins like folic acid, and avoiding tobacco and alcohol is a great start for having a healthy baby.

Maternal illnesses increase the chance that the baby will be born with a birth defect or having a chronic health problem, maternal diabetes, cytomegalovirus and toxoplasma infection can cause an adverse outcome of pregnancy, so mothers learning these illnesses can go long way to minimize their effects (Moore and Persaud, 2008).

In general population, the overall risk for having a child with a major malformation is 3-5%. They are the leading cause of infant's deaths, accounting for more than 20% of all infant deaths. Babies born with birth defects, have a greater chance of illness and long term disability than babies without birth defects (James et al, 2005).

A birth defect is an abnormality in structure, function or metabolism present at birth, which results in physical or mental disabilities or death. Thousands of different birth defects have been identified (NIH, 2009). Birth defects are the leading cause of death in the first year of life (Mathews and MacDorman, 2008).

Nowadays, advances in imaging techniques such as ultrasound as well as biochemical testing have allowed the detection of many anatomical defects before birth. Prenatal screening is an issue that has become more important over the past few years. For most women this test provides reassurance that their fetus does not appear to have certain serious anomalies. Maternal serum testing in the second trimester is the standard of care in many countries for screening women at risk for fetal aneuploidy and neural tube defects (James et al, 2005).

It has been known that the best moments for ultrasound examination and biochemical tests of the most common fetal anomalies are late in the first trimester and in the middle of second trimester of gestation (Norem et al, 2005).

These two tests especially the ultrasound scans in the first and second trimesters are now routine part of antenatal care in the most developed countries. However, in Iraq limited information exist regarding birth defects, especially in Kurdistan region where no such studies have been performed on this subject, and as birth defects are relatively common here this study is aiming to investigate thoroughly about NTD and Down syndrome in order to facilitate their diagnosis prenatally and decrease the burden of such anomalies on the parents and on the society.

This study is designed to:

Find out the incidence of congenital anomalies present at birth among fetuses of pregnant women (NTD and Down syndrome).

Identify pregnancies at higher than average risk for having birth defects.

Evaluate prospectively maternal serum screening with human chorionic gonadotropin, Alfa fetoprotein, and unconjugated Estriol as a screening test for fetal birth defect (Down syndrome).

Estimate the value of prenatal maternal serum alpha fetoprotein screening compared with that of routine ultrasonography in the detection of such birth defects (NTD).

Test the efficacy of a screening protocol using a combination of maternal age plus three biochemical markers for the antenatal detection of fetal abnormalities (Down syndrome).

Find out the impact of lifestyle factors (such as folic acid intake, maternal diabetes, maternal weight, smoking, and socioeconomic status) on NTD and Down syndrome development in the newborn.

## **Epidemiology of Stroke in Erbil City**

**Name:** Kamaran Hassan Ismail

**Nature of Research:** Academy

**Degree:** Ph.D.

**Specialty:** Community Medicine

**Date the debate:** 13-7-2010

**Supervisor:** Asst Prof. Namir G Al-Tawil

### **Abstract**

Stroke is a syndrome characterized by the acute onset of a neurologic deficit that persists for at least 24 hours, reflects focal involvement of the central nervous system, and is the result of a disturbance of the cerebral circulation. The underlying pathologic process in stroke can be either ischemic or hemorrhage, usually from an arterial lesion. Ischemia accounts for about two-thirds, and hemorrhage for about one-third of stroke cases (Aminoff et al, 2005). The global burden of stroke is large, yet there are still gaps in our knowledge (Strong et al, 2007). It is a disease that predominantly occurs in mid-age and older adults. WHO estimated that in 2005, stroke accounted for 5.7 million deaths world wide, equivalent to 9.9 % of all deaths. Over 85% of these deaths occurred in people living in low and middle income countries and one third occurred in people aged less than 70 years (WHO, 2006).

Stroke is a major cause of death and serious long-lasting neurological disability. The temporal trends of stroke epidemiology have been studied in many countries during the last decades, but although stroke mortality has decreased for many decades. As the elderly population is growing in the developed countries and stroke incidence is much higher among the elderly, time trends for stroke incidence are important in planning of health strategies and to evaluate primary and secondary preventive measures (Hallstrom et al, 2008).

A WHO collaborative study showed that stroke incidence rates ranged from 0.2 to 2.5 per 1000 population per year, the variation being mainly due to differences in the age structure of the populations involved. Age-standardized rates for men were 2 per 1000 in Colombo (Sri Lanka), 4 to 8 in most European countries, but 15 in Akita (Japan). Female rates were on average 30 per cent lower. The highest morbidity figures come from Japan. Analysis of data from major urban university hospitals in India suggests that nearly 2 per cent of all hospital cases, 4.5 per cent of medical and 20 per cent of neurological admissions are from stroke (Park, 2005).

Mortality from haemorrhagic stroke declined consistently over the 20th century in many countries, but ischaemic stroke showed a rise and a fall, mirroring the coronary heart disease epidemic (Lawlor et al, 2002). These different secular trends indicate that the risk factors for the two subtypes of stroke may differ. Changes in major cardiovascular risk factors may explain up to two thirds of the decline in mortality from stroke (Tuomilehto et al, 1991; Vartiainen et al, 1995).

In Japan, even though concentrations of blood cholesterol rose from the 1960s to the 1980s, rates of ischaemic and haemorrhagic stroke have fallen dramatically (Shimamoto et al, 1989; Kubo et al, 2003). The lack of an association between all types of stroke and

concentrations of cholesterol may mask a positive association with ischaemic stroke and an inverse association with haemorrhagic stroke, although the relation with haemorrhagic stroke may not be causal (Hart et al, 2000; Wannamethee et al, 2000). Studies of different populations give imprecise estimates of the association between cholesterol and subtypes of stroke (Suh et al, 2001; Bots et al, 2002; Zhang et al, 2003).

Despite the decline in mortality from stroke over recent years, there is a looming epidemic of stroke. The increased proportion of the population in the older age groups that is predicted to occur in future years will contribute to this epidemic (Nicol and Thrift, 2005). Outcome following stroke is influenced by a number of factors, the most important being the nature and severity of the resulting neurologic deficit. Patient's age, cause of stroke, and coexisting medical disorders also affect prognosis. Overall, somewhat less than 80% of patients with stroke survive for at least 1 month. Of patients who survive the acute period, about one-half to two-thirds regain independent function, while approximately 15% require institutional care (Aminoff et al, 2005). A major influence on outcome is the stroke subtype, with patients suffering haemorrhagic stroke more likely to die within the first 30 days than those suffering ischaemic stroke (Lee et al, 2003a). Access to treatments may also influence outcome. Early acute care is essential for optimal outcome (Evenson et al, 2001), but may be compromised by delays in response, transportation to an appropriate medical facility and diagnostic procedures.

Several factors are known to increase the liability to stroke; the most important of these are hypertension, heart disease, diabetes mellitus, cigarette smoking, and hyperlipidemia (Ropper and Brown, 2005). Some evidences indicate that the decline in the incidence of stroke observed in many countries is due to better management of hypertension (MacWalter and Shirley, 2002). Despite recognition of modifiable risk factors for a first stroke and the availability of well-known treatments, suboptimal control of risk factors continues to contribute to more than 700,000 strokes in the United States each year. For example, only 29% of Americans with hypertension have blood pressure lower than 140/90 mmHg, and up to 50% demonstrate poor or only partial adherence to medication regimens. Follow-up visits are important for improving patient outcomes. Self-monitoring is an effective method to help promote nutrition and weight loss and to decrease smoking and alcohol abuse. Interventions that promote patient participation contribute to improved patient outcomes in those with chronic disease (Gorelick et al, 1999). The burden of chronic non-communicable disease is rising rapidly and has now become a major challenge to global development. Unfortunately, low and middle income countries are bearing the brunt of these diseases that will have significant social, economical, and health consequences. Iraq has witnessed an epidemiological transition with increasing prevalence of chronic non-communicable diseases (WHO and COSIT, 2006).

Currently, no published data regarding the incidence rate (neither hospital-based nor community-based), risk factors, and follow-up for outcome in terms of case fatality, recurrence and functional disability of stroke are available in Erbil city. Therefore, there is a need to have local data on stroke in order to be utilized for developing a prevention and control program.

# **Evaluation of Antibacterial Activity of Ascorbic Acid and Sodium Nitrite against Uropathogenic Escherichia Coli**

**Name:** Safaa Toma Hanna

**Nature of Research:** Academy

**Degree:** Ph.D.

**Specialty:** Microbiology

**Date the debate:** 3-10-2010

**Supervisor:** Asset Prof. Nabeel E. Waheda

Asst Prof. Pishtewan H. Al-BAzzaz

## **Abstract**

Urinary tract infections carry a high risk of recurrence and antibiotic resistance due to biofilm formation. Bacterial resistance to the conventional antibiotics has become a complicated matter in the treatment of urinary tract infections, particularly with emergence of new strains resistant to high range of antibiotics. Acidification of nitrite-rich infected urine would induce strong antibacterial effect against nitrate-reducing bacteria involved in urinary tract infections. Acidification of nitrite results in formation of nitric oxide (NO) and other reactive nitrogen intermediates (RNIs), which are toxic to variety of bacteria.

This study aimed to assess the antibacterial effect of acidified sodium nitrite against nitrate-reducing bacteria involved in urinary tract infections. The study was carried out in Rizgari Teaching Hospital/ Erbil city and included patients referred by urology department for general urine examination, during January to July, 2009.

Out of 1,296 collected urine specimens, only 7.6% showed pyuria, which revealed 5.6% UTI, while 2% showed to be sterile pyuria. The sensitivity of Griess test showed to be around

68%, while the specificity was around 84%. The most common bacterial species was *Escherichia coli* 43.2%. Around 54% of species that showed biofilm formation expressed rdar (red dry and rough) strains. Around 50% of species showed beta hemolysis. The most sensitive antibiotics were nitrofurantoin (81.3%). Mixing 10 mM ascorbic acid with 625  $\mu$ M sodium nitrite at pH 5 has resulted in inhibition around 94% of total *E. coli*. Bacterial self destruction occurred by sequential steps; first feeding bacteria with sodium nitrate-rich urine and then followed by acidification of urine. Growing uropathogenic *E. coli* (EPEC) in sub-minimal inhibitory concentrations (sub-MIC) of acidified sodium nitrite (ASN) formed from the (10mM Ascorbic acid + 160 $\mu$ M NaNO<sub>2</sub>) have resulted in 4-10 folds reducing MIC values for nalidixic acid, nitrofurantoin and ciprofloxacin but no effect was revealed on the third-generation-cephalosporin. In conclusion, strong antibacterial agent can be formed in acidified urine containing nitrite.

This antibacterial agent is strongly pH and nitrite dependent and is increased by addition of ascorbic acid. Sub-MIC of acidified sodium nitrite can result in inhibition of biofilm-formation and make bacteria be more sensitive to antibiotics, while sub-MIC of nitrite alone can enhance bacterial growth and further colonizing. Synergistic effects can be obtained by combination of acidified sodium nitrite with each of the ciprofloxacin,

nitrofurantoin and nalidixic acid. In contrast, antagonistic effect can be achieved by combination of ascorbic acid with ciprofloxacin.

# **Molecular and Immunological study of Human Papillomavirus Infections among Patients with Deferent Cervical Lesions in Kurdistan Region-Iraq**

**Name:** Katan Sabir Ali

**Nature of Research:** Academy

**Degree:** Ph.D.

**Specialty:** Microbiology

**Date the debate:** 27-7-2010

**Supervisor:** Professor. Jaladet S. Jubrael

Professor. Hisham Y. M. Ali

## **Abstract**

The present study was carried out to detect the prevalence rate of Human papillomavirus infection among women with different cervical lesions, to identify the high risk HPV genotypes and to estimation some immunological parameters in cervical secretions and serum of the studied patients such as IgA, IgG, IL-10 and TNF- $\alpha$  cytokines.

A total of 100 studied cases (80 patients and 20 controls) were cytologically classified into 5 groups namely atypical squamous cells undeterminate significance (ASC-US) group (20 samples), low-grade squamous intraepithelial lesions (CINI) group (30 samples), high-grade squamous intraepithelial lesions (CINII-III) group (16 samples), cervical carcinoma group (14 samples), and (healthy cervix) control group (20 samples). Genomic DNA was extracted from cervical scrapped cells of the studied cases and HPV-DNA PCR technique using screening PCR kit was performed on entire genomic DNA samples. Then high risk (HR) HPV genotyping was performed on HPV DNA positive samples by HR HPV typing PCR kit. Both serum and cervical secretions samples were tested to estimate the levels of IgA and IgG by single redial immune diffusion (RID) technique. Moreover, estimation of IL-10 and TNF- $\alpha$  cytokines was performed on both mentioned samples utilizing ELISA technique.

The estimated result indicated that HPV DNA was detected in 17.5% of the studied patients and it was absence among the control group. HPV type16 was the most common type detected among the positive studied cases with prevalence rate of 28.4 % followed by HPV type 52 (21.4%), for each of HPV35, HPV56 (14.3%) and (7.1%) for each of the HPV33, HPV45, and HPV39 genotypes.

The highest reported rate of HPV DNA was (5.0 %) among cases with age-group of 55-64 years. Non significant correlation was reported among HPV DNA positive cases in relation to age at marriage, marital states, oral contraceptive intake, smoking habit, and educational levels. The HPV prevalence was observed more commonly in patients with increase parity and with low socioeconomic status.

The estimation of the cervical secretions levels of IgA and IgG found to be significantly higher in patients with HPV DNA positive compared to controls. However, a non significant difference in the mean serum levels of IgA and IgG were observed between the studied patients and control group. On the other hand, estimation of IL-10 levels in cervical secretions shown to be significantly higher in patients with HPV DNA positive compared to controls. Moreover, the levels of TNF- $\alpha$  in cervical secretions was shown to

be increased in patients compared to control group but with non significant differences. On the other hand, a non significant difference in the mean serum levels of IL-10 and TNF- $\alpha$  was observed between the studied patients and control group.

The study was concluded that utilizing diagnostic tool molecular PCR technique, with using specific primers are shown to be a more powerful and sensitive method compared to cytological examination for HPV detection. The increase of IgA levels in cervical secretions of studied patients suggesting that the local humoral immune response is ineffective in preventing this viral infection. The observed local production of IL-10 in cervical secretions indicated that the Th2 is relatively dominant and IL-10 can be used as a useful immunological marker for evaluating the aggressive local immune response in patients with different cervical lesions.

# Phenotypic Characteristics of Methicillin Resistant *Staphylococcus aureus* in Erbil City

**Name:** Aza Bahadeen Taha

**Nature of Research:** Academy

**Degree:** Ph.D.

**Specialty:** Microbiology

**Date the debate:** 27-7-2010

**Supervisor:** Professor. Sabria M. Said Al-Salihi

## Abstract

The study included collection of 377 of *Staphylococcus aureus* from different clinical sample to investigate the phenotypic characteristics of 114 of community and hospital acquired methicillin-resistant *Staphylococcus aureus*. The results showed that the detection of penicillin binding-protein 2a and oxacillin salt agar have higher sensitivity and specificity than disc method for identification methicillin-resistant *Staphylococcus aureus*. methicillin-resistant *Staphylococcus aureus* percentage was higher in hospital acquired than community acquired, which isolated from wound, urine, diabetic foot, skin abscess, and sputum, and mostly were homogeneous methicillin-resistant *Staphylococcus aureus* with higher minimal inhibitory concentrations value than the heterogeneous. The multi-resistance was characteristic of methicillin-resistant *Staphylococcus aureus*, which have higher antibiotics resistant and B-lactamase production than methicillin-sensitive *Staphylococcus aureus*. The minimal inhibitory concentrations value between community and hospital acquired methicillin-resistant *Staphylococcus aureus* were different. The most effective antibiotics was gatifloxacin followed by moxifloxacin, rifampicin, tobramycin, and levofloxacin. However, the combinations of rifampicin with gentamicin were most effective. methicillin-resistant *Staphylococcus aureus* value of minimum bactericidal concentration, and tolerance to B-lactam antibiotics. Minimal inhibitory concentrations value of B-lactam antibiotics were increased with decreased with acidity. The resistance to ciprofloxacin increased with heat shock treatment. No vancomycin resistant *Staphylococcus aureus* and vancomycin intermediate *Staphylococcus aureus* were isolated, while three isolations of heterogeneously vancomycin intermediate *Staphylococcus aureus* were reported.

# **Epidemiology and Risk Factors of Hepatitis B Infection in Kurdistan Region**

**Name:** Samir Mahmood Othman

**Nature of Research:** Academy

**Degree:** Ph.D.

**Specialty:** Community Medicine

**Date the debate:** 16-6-2010

**Supervisor:** Professor. Tariq S. Al-Hadithi

## **Abstract**

This work stemmed from the fact that Hepatitis B Virus infection constitutes a major public health problem and is a common cause of morbidity and mortality worldwide. There is consequently a need to find out the extent of the problem and ways in which risk occurs. There is also a need to evaluate factors associated with increased transmission of HBV infection in the region. Therefore, among the first aim of this work was to find out the prevalence of various HBV serological markers among Kurdish population in Kurdistan region. Next, to find out the association of HBV infection with various socio-demographic characteristics of study sample, and to detect a possible association of HBV infection with various risk factors.

This cross-sectional study was carried out from 1<sup>st</sup> Nov. 2007 through 31<sup>st</sup> Oct. 2009, involving 2324 healthy individuals selected by multistage cluster sampling technique. Blood samples were collected over a period of 12 months. Assessment of the prevalence of various serological markers was achieved by the use of immunoassays (ELISA and electro-chemiluminescence assay) at the Public Health Laboratory Center, in Erbil city. The overall prevalence of HBsAg, anti-HBc and anti-HBs were 2.4%, 8.9% and 23.2%, respectively. The overall prevalence of serological markers was significantly higher in Duhok governorate. HBsAg prevalence had no significant association with various socio-demographic characteristics of study sample, including age and gender. The prevalence of anti-HBc was significantly increasing with advancing age and significantly associated with marital status, occupation, educational level and vaccination. Anti-HBs prevalence, anti-HBs concentration and anti-HBs protectivity had a significant association with vaccination status and vaccination doses and they were declining with advancing age. A relatively low rate of HBeAg (9.1%) and high rate of anti-HBe (81.8%) among positive HBsAg subjects were detected. Multiple logistic regression analysis revealed that, HBsAg prevalence was significantly associated with blood transfusion, blood donation and history of surgical and/or dental procedures, anti-HBc with history of surgical and/or dental procedures, frequent drug injections and sharing utensils (toothbrushes and/or razors), while anti-HBs was only significantly associated with history of HBV vaccination.

In conclusion, Kurdistan region like other parts of Iraq is an area of intermediate endemicity for HBV infection. Generally the prevalence of HBV infection among population has been declining since implementation of HBV vaccination for infants and risk groups. The study emphasized the importance of HBV vaccination in controlling infection and together with rigorous screening of blood donors in addition to the use of disposable syringes and transfusion sets with other hygienic measures.

# **Significance of serum zinc in relation to certain chronic complications and other biochemical parameters in patients with type 2 diabetes mellitus in Erbil**

**Name:** Yusif Baha'addin Ahmed

**Degree:** Ph.D.

**Specialty:** Internal medicine/Clinical Endocrinology

**Date of the debate:** 20/6/2010

**Supervisor:** Assistant professor. Taha Uthman Mahwi

## **Abstracts**

### **Background:**

Diabetes mellitus is a common chronic disease with high mortality and morbidity due to chronic complications. Many studies looked at zinc in patients with DM, Most of these studies concluded that serum zinc will decrease in diabetic patients. Furthermore zinc has been regarded as an antioxidant that may be helpful therapeutically for diabetic patients.

### **Objectives:**

The primary aim of this study is to assess serum zinc in type 2 diabetic patients in relation to certain long term complications and lipid profile.

### **Materials and methods:**

This study performed in Layla Qasem Hawler diabetic center between 19<sup>th</sup> June 2008 and was concluded on 30<sup>th</sup> December 2009.

The study is of 2 parts: part1 included 1included a 50 healthy subjects (as control group), for whom clinical assessment done and blood withdrawn for the following investigations; Fasting plasma glucose, Fasting serum cholesterol, LDL, HDL, Triglycerides, serum creatinin, serum albumin, and HbA1c .Then 2 ml of serum prepared and stored for assessment of zinc level.

Part 2 included 320 patients with type 2 DM, for whom a thorough medical assessment done including, history, physical examination with features of chronic complications. Then blood withdrawn for the following laboratory tests fasting plasma glucose, fasting serum cholesterol, LDL, HDL, Triglycerides, serum creatinin, serum albumin, and HbA1c .Then 2 ml of serum prepared and stored for assessment of zinc level. Zinc assessment done by atomic absorption spectrometry. information storage and statistical analysis was done by SPSS program

### **Results:**

We found that the mean serum zinc of healthy control subjects was 116µgm/100ml, while the mean serum zinc of patients with type 2 DM was 84 µgm/100ml. We also

found that 14% of type 2 diabetic patients have serum zinc levels below normal range, the percentage of certain chronic diabetic complications was significantly higher in patients with lower serum zinc than in patients with normal serum zinc. there is no direct relationship between serum zinc and serum lipid profile in type 2 diabetic patients.

**Conclusions:**

Type 2 diabetic patients have lower serum zinc than healthy subjects. the percentage of chronic diabetic complication is higher in patients with low serum zinc, there is no direct relationship between serum zinc and serum lipid profile.

## **Evaluation of serum Xanthine oxidase as oxidative stress enzyme and its relation to $\alpha$ -L-Fucose level in myocardial infarction in Erbil city.**

**Name:** Dler Rostum Ali

**Nature of Research:** Academy

**Degree:** Ph.D.

**Specialty:** Biochemistry

**Date the debate:** 25/7/2011

**Supervisor:** Assist. Prof. Tayfoor J. Mahmoud

Professor .Hamid G. Hasan

### **Abstract**

This study was conducted during the period between February 2009 until January 2011 in the department of medical biochemistry / college of medicine / Hawler medical university / Erbil / Iraq.

The present investigation was carried out on (210) volunteers, which were divided into two groups:

Group I (Control group): One hundred randomly selected subjects (70 males and 30 females) were served. All are apparently healthy volunteers, their mean ages were ( $53.28 \pm 5.97$ ) years and ranged between (35-75) years.

Group II (Acute myocardial infarction group): One hundred and ten (76 males and 34 females) acute myocardial infarction patients (diagnosed by consultants) were participated in the study. Their mean ages were ( $56.31 \pm 6.03$ ) years and ranged between (38-80) years.

Blood specimen was obtained from acute myocardial infarction patients attending Coronary Care Units in Hawler teaching Hospital, and separated serum was used for measurements of serum total fucose, protein bound fucose, total protein, XO activity, MDA, Vitamin-C and total calcium of both patients and controls.

Biochemical parameter levels were determined by applying spectrophotometrical analysis in the research laboratory of Clinical Biochemistry / College of Medicine / Hawler Medical University.

In literature, no report was found about the investigation of fucose levels and fucosylated glycans in acute myocardial infarction, therefore the present study was designed to assess the biochemical changes in this diseases.

The obtained results can be summarized as follows:-

The mean level of serum xanthine oxidase activity in acute myocardial infarction patients was significantly higher ( $p < 0.001$ ) than that of healthy controls.

Serum Vitamin-C concentration of acute myocardial infarction patients was significantly lower ( $p < 0.01$ ) than that of healthy controls.

Serum malondialdehyde concentration of acute myocardial infarction patients was significantly higher ( $p < 0.01$ ) than that of healthy controls.

There was no any significant difference in the level of serum total protein between the two groups.

The level of serum total fucose concentration in acute myocardial infarction patients highly significant ( $p < 0.01$ ) than that obtained in normal group.

Serum protein bound fucose of acute myocardial infarction patients was significantly higher ( $p < 0.01$ ) than that in healthy controls.

There was no any significant difference in the level of serum calcium between the two groups ( $p > 0.01$ ).

Ratio of total fucose/total protein revealed a significant increase ( $p < 0.01$ ) between both groups.

The serum xanthine oxidase activity was positively correlated with serum level of malondialdehyde in acute myocardial infarction group.

There was a negative correlation between serum vitamin-C and serum malondialdehyde levels in acute myocardial infarction group.

There was a positive correlation between total fucose and protein bound fucose levels in acute myocardial infarction group.

No any significant differences were seen in any of the investigated parameters between different genders.

From the above results, one can conclude that glycoproteins were found to have a specific role as an immune modulator for inflammation, this was proved by the elevation in protein bound fucose and total fucose in this study. As a result the author suggested that XO can play an oxidative stress role while total fucose had an antioxidant role.

# **Flow Cytometric Profiles of Acute Leukemia: a Comparative Study of Morphologic and Immunophenotyping Diagnose**

**Name:** Dana Ahmed Abdullah  
**Nature of Research:** Academy  
**Degree:** Ph.D.  
**Specialty:** Hematopathology  
**Date the debate:** 21/2/2011  
**Supervisor:** Michael D. Hughson MD  
Anwar Sheikha MD

## **Abstract**

There is no doubt that the French-American-British (FAB) classification has added clarity to a previously confused area of leukemia diagnosis and has helped better the communication between hematologists and hematopathologists. Despite the value of the FAB classification, major current advances in immunophenotyping, cytogenetics, and molecular genetics have all added considerably to our understating of the biology of leukemias and their response to different strategies of chemotherapy. This work included 135 pediatric and adult acute leukemias (AL) conducted over a 15 months period of this study. The patients were mostly from the three Kurdistan regional governorates but included few patients from the mid and south of Iraq. This study aimed first to introduce flow cytometry (FC) into the clinical practice of hematology in the Kurdish region of Iraq by establishing a functional FC unit in Iraqi Kurdistan. Secondly, the study aimed to investigate by FC the proportional rates of acute lymphoid and acute myeloid leukemia occurring in our clinical practice. Third, the study aimed to compare FC diagnoses with the conventional diagnosis of acute leukemia using a modified FAB-cytochemical system.

By FC, 55.6% of the 135 AL were classified as acute myeloid leukemia (AML) and 44.4% as acute lymphoblastic leukemia (ALL). The AML were predominantly adultas (>15 years). Among the ALL, 75% were B-ALL with an average age of  $10.7 \pm 10.5$  years, and 25% T-ALL with an average age of  $13.9 \pm 7.9$  years. The study also observed the close association between T-ALL with a mediastinal mass and higher leukocyte counts than B-cell phenotype.

Among the precursor B-and T-cell ALL, the common B-cell ALL (CD10-ve, cytoplasmic I $\mu$  chain+ve) comprised 50% of all ALL subtypes. The distribution of different ALL phenotypic classes were comparable to most international studies. AML morphological diagnosis was more heterogeneous. Morphologic FAB and FC phenotypic correlations were high for AML M3 and M6 and to lesser degrees for other FAB subtypes. By FC, lineage was reversed from AML to ALL and vice versa in 6/130 (4.6%) of patinets and in 5/135 (3.7%) of patinets allowed a lineage determination that could not be assigned morphologically. FC produced intralineage shifting to a different AML subtype in 6 patients (8% of AML). The findings also show the superior ability of FC to subclassify AL.

# Construction of Plasmids from Homologous Recombination Study as an Attempt for DNA Vaccine

**Name:** Evan Latef Khalef

**Nature of Research:** Academy

**Degree:** Ph.D.

**Specialty:** Molecular Biology

**Date the debate:** 4/8/2011

**Supervisor:** Asset Prof. Farhad M. Abdulkarim

## Abstract

Our study was started with the deletion of bla gene from the plasmid pBR322-dRek which contains two antibiotic resistance genes. Two primers were used AMpus and PSGS1 to delete bla gene and construct pBR322- $\Delta$ amp-dRek plasmid.

A one hundred fifty base pair (150bp) Rek-sequence amplified using two primers Rek1 and Rek3 in order to clone it at EcoRI site upstream to tetr gene to construct pBR322-dRek plasmid. The two flanked homology region of tetr gene in pBR322-dRek plasmid undergo fluctuation test in order to measure the rate of spontaneous homologous recombination. Four experiments done to measure the rate of spontaneous homologous recombination between double Rek fragments and the rate was 65% in experiment (1), 64% in experiment (2), 66% in experiment (3), and 65% in experiment (4). Two controls were used in the fluctuation test, the plasmid pBR322 without any modification and pBR322-dRek on LB-amp plate considered as a viable control. The deletion of tetr gene confirmed by PCR amplification and restriction digestion enzyme.

The essential gene infA cloned into pTrc99A plasmid in order to clone it in the future into pBR322- $\Delta$ amp-dRek plasmid to be as essential gene instead of antibiotic resistance gene. Successfully the fundamental steps was done, infA gene (600bp) was amplified from chromosome of E. coli W3110 and it was cloned into pTrc99A at NcoI and SmaI sites to be under LacIq/trc promoter to give pTrc600 plasmid. The result confirmed by restriction digestion.

On the other hand, infA operon (2000bp) amplified and cloned into pTrc99A at BamHI and SalI sites to give pTrc2000 plasmid. The plasmid pTrc-2000 then used as template to delete structural infA and give up pTrc- $\Delta$ sinfA plasmid. The result confirmed by restriction digestion by BamHI.

The plasmid pTrc2000 served as template for PCR amplification to delete structural infA gene from infA 2000bp, the result yielded pTrc- $\Delta$ sinfA plasmid. The plasmid pTrc- $\Delta$ sinfA digested by BamHI and SalI and the fragment 1400bp ( $\Delta$ sinfA fragment) then cloned into pKO3 plasmid at BamHI and SalI sites in order to use the resulted plasmid pKO3- $\Delta$ sinfA in allele exchange in the future.

# **A Study of K-ras Mutation in Colorectal Carcinoma in Kurdistan Region – Iraq**

**Name:** Ava Tahir Ismail

**Nature of Research:** Academy

**Degree:** Ph.D.

**Specialty:** Histopathology

**Date the debate:** 13/8/2011

**Supervisor:** Professor. Nasir Abdul-Salam AL-Allawi  
Assistant Professor. Nadia Yassuob Ahmed

## **Abstract**

Colorectal carcinoma appears to be a multistep carcinogenic process, that involves a series of events as mutational activation of oncogene coupled with the mutational inactivation of the tumor suppressor genes. Point mutations of K-ras oncogene was studied in several investigations as an initial event of tumorigenesis of human colorectal cancer. This study concerns the frequency, spectrum and the clinico-pathologic significance of point mutations of K-ras oncogene, using K-ras strip assay kit, among 50 patients with sporadic CRC in Iraq, a country that was not previously investigated. Activation of cellular ras genes is caused by a single base mutation resulting in an amino acid substitution yielding protein with increased transforming ability. In addition; nuclear accumulations of cell cycle regulatory proteins (p53, p21 WAF1/CIP1 and cyclin D1) were evaluated by immunohistochemistry and correlated with the K-ras mutation and variable clinico-pathologic parameters.

Out of the fifty enrolled patients, 24 (48%) had K-ras mutations. A total of 29 mutations were identified in the tumors of the latter 24 patients (20/24 tumors had single mutations, 3/24 had double mutations and 1/24 had triple mutations). The most frequently encountered mutations were the G>T transversions and G>A transitions (41.3% each) followed by the G>C trasversions at 17.3%. Codon 12 mutations constituted 89.7%, while codon 13 the remaining 10.3%. The most frequent mutation identified in codon 12 was GGT>GTT (Gly>Val), followed by GGT>GAT (Gly>Asp), while all three mutations identified in codon 13 were GGC>GAC (Gly>Asp).

The immunoexpression of p53 was identified in 54% of the patients while p21 WAF1/CIP1 and cyclinD1 were overexpressed in 44% and 66% of the cases, respectively. Cyclin D1 overexpression was significantly correlated with age and tumor histology while p21 WAF1/CIP1 overexpression correlated significantly with tumor histology only. The level of each of the studied cell cycle regulators did not seem to have significant clinico-pathologic correlations by itself.

No statistical correlation was observed between K-ras point mutation and cell cycle regulatory proteins; however we found significant interrelationships between cell cycle regularory proteins' immunoexpression, probably indicating their contribution to the regulation of cell growth, through different pathways in colorectal carcinogenesis.

Seventy six percent of conventional adenocarcinoma showed multiple molecular alteration whether in K- ras mutation or cell cycle regulatory proteins over expression and 40% of them showed all four alteration while non of the mucinous + signet ring had more than one genetic alteration with significant correlation (p value = 0.001), suggesting

that other molecular alterations underlying the carcinogenesis and development of the later histological type.

In conclusion, the frequency of K-ras mutations among Iraqi CRC patients is similar to that reported in some developed countries; however the spectrum of these mutations were relatively different which is most likely to be related to differences in diet and carcinogen exposure.

# **Evaluation of Certain Immunological and Biochemical Parameters in Patients Afflicted with Prostatic Tumors before and after Treatment**

**Name:** Azad Mohammad Kamal-Aldin

**Nature of Research:** Academy

**Degree:** Ph.D.

**Specialty:** Immunology

**Date the debate:** 26/4/2011

**Supervisor:** Dr. Nabeel E. Waheda

Assistant Professor. Shawqi Ghazala

## **Abstract**

A total of (185) patients complaining from urination disorder due to prostatic disorders were enrolled in the present study during their attendance to urology department at Rizgary teaching hospital in Erbil city, from the period of January 2009 to April 2010, their age's matches (54-78) years, in addition to 20 male apparently healthy consider as control group with the same age range group. According to the clinical investigations, the patients were categorized into 145 benign prostatic hyperplasia (BPH) and 40 prostatic cancer (PCa) patients and according the treatment the patients were categorized into 145 BPH patients 20 of them were treated by finasteride drug 5mg/day. The rest of BPH patients were treated by surgical interference either by transurethral resection of the prostate (TURP) or retropubic prostatectomy (RPP) and 20 of them were followed. Out of 40 PCa patients 10 of them have had localized PCa they were treated by radical prostatectomy (RP). Out of 40 PCa 30 patients have had metastatic PCa and they were treated by hormonal block (orchidectomy and flutamide drug 250 mg three time daily). Different immunological and biochemical parameters were evaluated for above patients before treatment after one and two months of treatment.

The results demonstrated that the frequency of prostatic tumors was higher in patients with body mass index (BMI) over weight (25-29.9) kg/m<sup>2</sup>, the frequency of prostatic tumors was higher in patients with positive family history. The higher frequency of prostatic tumor patients was occurred in age range group (70-79) year. The results revealed a highly significant increase in mean concentration of prostatic acid phosphatase (PAP) U/L before treatment in sera of BPH, localized and metastatic PCa patients in comparison to control group while a highly significant increase in mean concentration of total acid phosphatase (ACP) U/L in sera of localized and metastatic PCa patients groups in comparison to control group, and a highly significant increase in mean concentration of alkaline phosphatase (ALP) U/L in sera of metastatic PCa patients group in comparison to control group (P<0.001). In all BPH patients groups before treatment either by finasteride drug 5m/day or surgery , the results demonstrated that a highly significant increase in mean values of serum prostatic specific antigen (PSA) ng/ml and tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ) Pg/ml (P<0.001), while a significant increase was obtained in mean value of serum and interleukin -10 (IL-10) Pg/ml in comparison to control group (P<0.05). After two months of treatment by finasteride drug in BPH patients group the results revealed a significant reduction in mean values of serum PSA ng/ml, TNF- $\alpha$  Pg/ml and luteinizing hormone (LH) mIu/ml, while a testosterone ng/ml

hormone in comparison to their mean values in significant increase in mean values of serum IL-10 Pg/ml and patients before treatment ( $P<0.05$ ) After two months of treatment by surgery in BPH patients group the results demonstrated that a highly significant reduction in mean value of serum PSA ng/ml ( $P<0.001$ ), a significant reduction in mean value of serum TNF- $\alpha$  Pg/ml in comparison to their mean values in patients before treatment ( $P<0.05$ ). Before treatment by radical prostatectomy (RP) in localized PCa patients group the results revealed a highly significant elevation in mean values of serum PSA ng/ml, CD8%, TNF- $\alpha$  Pg/ml and IL-10 Pg/ml and a highly significant reduction in mean values of freePSA/total PSA%, CD4%, CD4/CD8 in comparison to control group ( $P<0.001$ ).

After two months of treatment by RP the results showed a highly significant reduction in mean values of serum PSA ng/ml CD8% , TNF- $\alpha$  Pg/ml, and IL-10 Pg/ml and a highly significant elevation in mean values of CD4%, and CD4/CD8, testosterone ng/ml and LH mIU/ml, in comparison to their mean values in patients before treatment( $P<0.001$ ). Before treatment by hormonal block in metastatic PCa patients group the results showed a highly significant elevation in mean values of serum PSA ng/ml, CD8%, TNF- $\alpha$  Pg/ml, IL-10 Pg/ml and a highly significant reduction was obtained in mean values of CD4%, and CD4/CD8 ( $P<0.001$ ), while a significant reduction revealed in mean values of freePSA/total PSA% , testosterone ng/ml and LH mIU/ml in comparison to control group ( $P<0.05$ ). After two months of treatment by hormonal block the results showed a highly significant reduction in mean values of serum PSA ng/ml, CD8%, TNF- $\alpha$  Pg/ml, IL-10Pg/ml and testosterone ng/ml, and a highly significant elevation in mean values of CD4%, CD4/CD8 and LH mIU/ml in comparison to their mean values in patients before treatment ( $P<0.001$ ).

# **The coronary angiography finding and the in-hospital complications of coronary catheterization among patients suspected to have coronary heart Disease in Duhok Heart Center**

**Name:** Siyamand Hasan Mohaidin

**Nature of Research:** Academy

**Degree:** Ph.D.

**Specialty:** Cardiology

**Date the debate:** 22/8/2011

**Supervisor:** Professor. Sabri K. Shaikhow

## **Abstract**

Coronary arteriography establishes the presence or absence of coronary stenoses, defines therapeutic options, and determines the prognosis of patients with symptoms or signs of ischemic coronary artery disease. Coronary arteriography can also be used as a research tool to evaluate serial changes that occur after PCI or pharmacological therapy ( Libby 2007 ).

The objectives of this study are to study the severity of coronary arteries and to detect the proportion of complications that might occur during catheterization.

Studied patients included 1153 diagnostic coronary catheterization (501 females and 652 males with mean age 54.7 years) and 227 patients who had therapeutic intervention (67 female and 160 male with mean age 54.2 years). During procedures 267 stents were put for 210 patients in 240 arteries. But 11 patients had difficulties in putting the stent and 6 patients had only balloon angioplasty. The study was done during the period from July 1, 2009, to May 31, 2010, in Duhok heart center, Azadi Hospital. All patients were evaluated by history, clinical examination and laboratory investigations.

The abnormal result of the diagnostic catheterization was 74.2% for males and 45.9% for females. The major risk factors were diabetes, hypertension, smoking, and positive family history. The main involved coronaries were LAD, RCA, and CX. The significant complications were local hematoma (2.4%), retroperitoneal bleeding (0.17%), massive bleeding (0.26), and coronary dissection (1.04%).

In conclusion male patients were more than female, normal coronary artery reported more in females; diabetes mellitus was the potent risk factor and associated with multiple coronary involvements.

# Evaluation of serum Chromium (III) in Patients with Thyroid Dysfunction and its Correlation with T3, T4 and TSH levels

**Name:** Parween Abdulasamad Ismail

**Degree:** Ph.D.

**Specialty:** Biochemistry

**Date the Debate:** 29/9/2011

**Supervisor:** Asset Prod. Tayfoor J. Mahmoud  
Prof. Hamid G. Hasan

## Abstract

Abnormalities of thyroid function are usually related to production of too little thyroid hormone (hypothyroidism) or production of too much thyroid hormone (hyperthyroidism). Many studies looked at an interaction between thyroid hormone and chromium ions metabolism in thyroid diseases, Most of these studies concluded an abnormal chromium metabolism in thyroid dysfunction patients.

The primary aim of this study is to assess serum chromium concentration in hypothyroidism, hypothyroidism and control subjects and to find a relationship the concentration of chromium hormonal disorder in patients with thyroid dysfunction.

This study was performed during the period between January 2010 and February 2011.

The subjects of the present study comprised three groups:-

1-Group one: Consisted of 110 apparently healthy individuals (70 females and 40 males), their mean age was  $(48.33 \pm 1.03)$  and ranges from (20-79) years.

2- Group two: Consisted of 200 diagnosed hypothyroidism patients. (140 females and 60 males), their mean age was  $(48.5 \pm 0.91)$  and ranges from (20- 79) years.

3- Group three: Consisted of 200 diagnosed hyperthyroidism patients. (143 females and 57 males), their mean age was  $(49.6 \pm 2.07)$  and ranges from (20- 79) years.

The study included the estimation of serum:

1- Chromium concentration.

2- Human thyroid peroxidase activity.

3- Human thyroglobulin.

4- Triiodothyronine , Tetraiodothyronine and thyroid-stimulating hormone.

5- Total protein concentration.

Serum levels of chromium were measured using Atomic Absorption Spectrophotometer (AAS). The concentrations of serum total T3, T4, TSH, Tg and TPO activity were measured using Enzyme Linked Immunosorbant Assay (ELISA) method. Serum total protein concentration was measured by using UV/Vis. Spectrophotometer. Data obtained revealed the followings:

1-The mean values of serum chromium( $Cr^{+3}$  ), thyroid peroxidase (TPO) and thyroglobulin (Tg) were significantly lower in hypothyroidism patients  $(0.07 \pm 0.0173$  ? g/L),  $(0.65 \pm 0.038$  IU/L) ,  $(1.3 \pm 0.29$  ng/mL) respectively, and significantly higher in hyperthyroidism patients  $(1.344 \pm 0.098$  ? g/L),  $(128.3 \pm 5$  IU/L),  $(123 \pm 5$ .ng/mL) respectively as compared to control group  $(0.378 \pm 0.0240$  ? g/L),  $(22 \pm 0.5$  IU/L),  $(26 \pm 0.4$  ng/mL) respectively ;( $P < 0.001$ ).

2- Serum Cr+3 Concentration was decreased with age and significant negative correlation was observed between age and chromium level in men ( $r=-0.42$ ) and women( $r=-0.62$ ) in hypothyroidism patients, also significant negative correlation was observed between age and chromium level in men( $r=-0.25$ ) and women( $r=-0.32$ ) in hyperthyroidism patients.

3-There were significant positive correlations between serum chromium levels with T4( $r=0.710$ ) and T3 concentration ( $r=0.350$ ) in hypothyroidism patients. Also, there was a significant Positive correlation between serum chromium levels with T4( $r=0.871$ ), and T3 concentration ( $r=0.331$ ) in hyperthyroidism patients( $r=0.871$ ), whereas a Significant negative correlation was observed between serum chromium level with TSH level ( $r=-0.450$ ) in both hypothyroidism patients and hyperthyroidism patients( $r=-0.391$ ).

4-Significant Positive correlation was observed between serum Cr+3 level and TPO activity in hypothyroidism patients( $r=0.85$ ) and in hyperthyroidism patients( $r=0.781$ ).

5- There was a significant negative correlation between age and serum TPO activity in men ( $r=-0.32$ ), and women( $r=-0.41$ ) in hypothyroidism patients. Also, there was a significant negative correlation between age and serum TPO activity in men ( $r=-0.122$ ) and women( $r=-0.321$ ) in hyperthyroidism patients.

6- The mean value of serum total protein concentration was significantly higher in hypothyroidism patients ( $9.24\pm0.43$  gm/dL) and significantly lower in hyperthyroidism patients ( $5.32\pm0.61$  gm/dL) as compared to control group than ( $7.25\pm0.33$  gm/dL).

On the basis of the findings of this study:-

1-Serum chromium (III) concentration was found to be significantly lower in hypothyroidism patients and significantly higher in hyperthyroidism patients indicating links between chromium and thyroid function and possibly in the development of thyroid dysfunction

2- There was a significant positive correlation between Serum chromium (III) concentration and Serum T3 and T4 and significant negative correlation between Serum chromium (III) concentration and Serum TSH concentration in hypothyroidism and hyperthyroidism .This finding indicate that thyroid hormones influence chromium metabolism by affecting chromium absorption and excretion. Additionally, chromium deficiency affects thyroid function

## 6-Conclusions and Recommendations

### 6.1- Conclusions:-

1-Serum chromium (III) concentration was found to be significantly lower in hypothyroidism patients and significantly higher in hyperthyroidism patients indicating links between chromium and thyroid function and possibly in the development of thyroid dysfunction.

2- There was a significant positive correlation between Serum chromium (III) concentration and Serum T3 and T4 and significant negative correlation between Serum chromium (III) concentration and Serum TSH concentration concentration in hypothyroidism and hyperthyroidism. Therefore thyroid hormones influence chromium metabolism by affecting chromium absorption and excretion. Additionally, chromium deficiency affects thyroid function.

3- Aging alters the metabolism of chromium by decreasing their serum Concentration.

4-The gender related differences in chromium levels in thyroid dysfunction, might be attributed to hormonal imbalance associated with thyroid dysfunction state.

5- Marked alterations in chromium homeostasis were observed in thyroid diseases and chromium deficiency causes thyroid dysfunction. Conclusions and Recommendations

6-The activity of TPO was significantly lower in hypothyroidism patients and significantly higher in hyperthyroidism patients, thus change in peroxidase activity relate to some of the essential changes in hormone synthesis in thyroid dysfunction.

7- There was a significant positive correlation between Serum chromium concentration and Serum thyroid peroxidase activity in hypothyroidism and hyperthyroidism patients.

8-The mean concentration of serum Tg was significantly lower in hypothyroidism and significantly higher in hyperthyroidism patients, so its serum measurement may be used in assessing the activity of thyroid gland.

9- The mean serum total protein concentration was significantly higher in hypothyroidism patients and significantly lower in hyperthyroidism patients.

#### 6.2- Recommendations.

1-Serum estimation of other trace elements such as Mn, Mg,Cu and Se may be useful for diagnosis of thyroid dysfunction.

2- Further studies may help define whether Cr supplementation could be an appropriate therapeutic approach for treating certain aspects of thyroid disease.

3-Assessing Relationship between thyroid volume, thyroid functions and chromium in different thyroid diseases with and without deficiencies of other elements should be assessed.

4-Studying the link of serum chromium levels with thyroid gland function in groups of well defined thyroid disorders in order to draw meaningful conclusions with regard to the role of chromium in thyroid physiology .

## **Safe Motherhood Needs Assessment in Erbil City**

**Name:** Awring Maroof Raof

**Degree:** Ph.D.

**Specialty:** Community Medicine

**Date the Debate:** 17/12/2011

**Supervisor:** Professor. Tariq Al-Hadithi

### **Abstract**

Safe Motherhood Initiative is a global effort to reduce maternal mortality and morbidity. The target is to reduce maternal deaths at least by half by the year 2000.

This study was an attempt to assess the needs for safe motherhood by checking the availability, use and quality of antenatal care, delivery care and postpartum care provided to women and newborn infants and identifying any gaps in the provision of these services at all levels within the health care system.

This is a descriptive cross sectional study carried out in Erbil city, between 1st of Jan 2009 to the 1st of Oct 2011. The tool used to prepare and carry out the survey and to analyse data was the "Safe Motherhood Needs Assessment" manual produced by the WHO. The survey forms included in the manual refer to the "Mother Baby Package" and to its standards of health care. Data were collected using certain Interview and Record Review forms.

The result showed that antenatal care coverage was poor (22.1%), antenatal care services and tetanus toxoid immunization was provided by primary health care centers. Essential obstetrical care services were available in the Maternity Teaching Hospital only. Mala-Afandy Health Center provides normal vaginal delivery services only. Absence of integration in the services provided in all the visited facilities was demonstrated. The quality of antenatal care as measured by the level of provider client communication showed that less than half of clients were provided with information about diet and nutrition, family planning information, benefit of birth in the health facility and the place of birth. Assessing the knowledge of clients of warning signs during pregnancy revealed that 67.4% of them considered heavy bleeding as danger sign and no one considered abnormal lie and multiple pregnancies as danger signs. The estimated maternity bed occupancy rate was 46% due to the low average length of stay (two days). In the catchments area, the average distance to the referral facility is 4Km and the mean referral time is 14.6 minutes, as the PHCCs surveyed were inside Erbil city.

In conclusion the coverage of various antenatal care activities according to antenatal care programme was poor. Health education provided at antenatal clinic level in Erbil city seems to be relatively poor. The overall quality of care was poor with no use of partography. There is a need for development of clinical guidelines and protocols.

# **Assessment of the primary Health Care System in Erbil Governorate Using a Multimodal Method**

**Name:** Nazar Pauls Shabila

**Degree:** Ph.D.

**Specialty:** Community Medicine

**Date the Debate:** 17/4/2012

**Supervisor:** Asset Prof. Namir G. Al-Tawil

## **Abstract**

While the need for re-organizing and restructuring the primary care system in Iraq as part of the overall health system is desperately recognized, there is limited research evidence on the challenges and needs of primary care system in Iraq particularly in Kurdistan Region. Therefore, the aims of this study were to evaluate the primary care system in Erbil governorate and identify its problems and needs as well as potential opportunities and barriers to change.

This study that was conducted in Erbil governorate from March 15th, 2010 to January 19th, 2012\_ employed a multimodal method. The first part included assessing the perspectives of 46 purposively selected policy makers, primary care managers and academics on the primary care system using open-ended questionnaire survey. The second part included exploring the range and diversity of primary care providers' viewpoints towards the primary care system using focus groups involving 40 randomly selected providers from 12 randomly selected primary health care centers and a Q-study involving another sample of 40 purposively selected providers from another sample of eight randomly selected centers. The third part included a Q-study of the health seeking behavior and perception toward health services of a sample of 40 persons that were purposively selected from different parts of Erbil governorate. The fourth part included an explorative cross-sectional study of the primary care referral system. The open-ended questionnaire survey and focus groups revealed significant impediments to delivery of primary care including inappropriate service delivery with particular emphasis on irrational use of services, irrational treatment and poor referral system; problems related to human workforce like uneven distribution, rapid turnover and limited opportunities for professional development; shortage in resources like medications and financing; lack of information technology and poor governance. Main suggestions for improving the system included application of family medicine approach and ensuring effective planning and monitoring. The Q-study of providers' and populations' viewpoints largely supported these concerns. The providers' Q-study identified different positive and negative viewpoints about the primary care services while the population Qstudy identified different patterns of health seeking behavior and viewpoints toward primary care services. The typical characterizations that were associated with each viewpoint were highlighted. This study has provided a comprehensive understanding of the factors that negatively affect the primary care system from different stakeholders' perspectives. The current primary care system faces enormous problems that might signal the need for important and comprehensive improvements in different aspects. However, it is not clear whether improvement within the current system will be beneficial or if there will be a

need to change the entire approach and reform the system like adopting family medicine system.

# **Protein-Protein Interaction and its Possible Roles in the Formation of Amyloid Fibrils (Amyloidosis)**

**Name:** Shereen Ismail Hajee

**Degree:** Ph.D.

**Specialty:** Biophysics

**Date of the debate:** 10/5/2012

**Supervisor:** assistant professor. Edrees M. T. Harki

## **Abstract**

The main goal of this study is the investigation of protein-protein interaction and its effect on aggregation as well as on amyloid fibril formation, and its possible role in controlling and inhibiting the formation of amyloid fibrils. So, for this purpose the study was done through three steps.

The first step in this study was using static light scattering (SLS) technique, for outputting of the second virial coefficient (B22) and average molecular weight (Mw). B22 is a parameter for detecting attraction and repulsion forces between protein molecules, and to identify the protein aggregation. In this part of the study the influence of salt, sugar, pH, urea, and temperature were investigated separately at different manner. It is observed that the type and concentration of salt has a significant effect on B22 parameter, when temperature and pH of protein solution remain constant. Increase of salt concentration lead to more negative B22. The high negative value of B22 is transferred to less negative value when sugar such as glucose, mannitol, and trehalose were used. Obviously it has a significant result in reducing aggregation of protein molecule.

When the temperature and salt concentration of protein solution stay constant, while the pH changed. It was concluded that the B22 has a minimum value when the protein molecule has the same number of positive and negative charge, but when acidity or alkaility of solution increased the B22 value will increased, and this is due to electrostatic effect.

Urea is another parameter used in this study to know if it has any effect on B22 value and Mw, at constant temperature and pH. The results show that urea concentration increase leads to decrease in B22 value and decrease in Mw of Ov albumin (OVA) and Bovine serum albumin (BSA). In addition, the profile of B22 against urea concentration a phase transition of the protein was observed, and two crevices obtained around 5M and 8M urea.

Temperature is the last factor used in this part of the study, when pH of solution stayed constant. It was observed that, when temperature increased from 25oC to 80oC B22 becomes more negative, in addition two transition temperatures were also obtained it is a phase transition behavior of a protein. More ever, it is also observed that at second transition temperature the molecular weight duplicated or triplicated.

An attempt has been made for reducing or inhibiting the aggregation of protein, this is done by adding some additives such as (l-arginine, glycerin, glucose, mannitol, and trehalose) separately to protein solution then the temperature raised from 25oC to 80oC, the result showed that l-arginine is the best one among those applied in inhibiting the

aggregation of BSA under the influence of temperature, by shifting B22 from negative to positive value at all temperature tested. Glycerol takes the second place in the arrangement; it has the ability to shift the second transition temperature from 70oC to 75oC, and increasing of B22 from more negative to less negative B22. The other additives had no significant effect on the amount of B22, and subsequently on the aggregation of protein molecule under the effect of temperature.

The second step in this study reinforces the result obtained by SLS, specially the effect of temperature on protein-protein interaction, turbidity measurement technique used for protein solution when the temperature increased to 80oC, also the effect of (Glucose, mannitol, trehalose, glycerol, L-arginine, and glycine) in different concentration manner on turbidity was studied. It is concluded that when temperature increased from 30oC to 65oC turbidity remained approximately constant, while it increased rapidly when the temperature increased from 70oC to 80oC, as well as two transition temperature also detected.

On the other hand, the effect of (Glucose, mannitol, trehalose, glycerol, L-arginine, and glycine) on turbidity of protein solution under the influence of temperature was studied. It is observed that L-arginine takes the first place arrangement in reducing turbidity, then glycerin, as well as trehalose takes a third place in arrangement, while the others have no significant effect.

A third step in this study was using Cong Red (CR) binding spectroscopy technique in detecting amyloid fibril formation. Amyloid fibril was formed from BSA under 70oC. In this part of study, it was observed that L-arginine and 20% glycerol possess an inhibitory potency against in vitro BSA amyloid fibril, when (L-arginine, glycerin, trehalose) were tested.

## **Health seeking behavior and consumer satisfaction with health care services in Erbil city**

**Name:** Wali Omer Abdurahman

**Degree:** Ph.D.

**Specialty:** Community Medicine

**Date Of The Debate:** 15/7/2012

**Supervisor:** Prof. Tariq S Al-Hadithi  
Prof. Samim A Al-Dabbagh

### **Abstract**

Like many transitional communities in the developing countries, a wide range of therapeutic choices coexist in Kurdistan region. This medical pluralism is one of the characteristic features of the health system. The available therapeutics choices for individual in the region range from self-treatment to public health system with its primary, secondary and tertiary elements, to a wide variety of private sector options. Everyday thousands of people become ill and make use of these health care services but little is known about their health seeking behavior.

The aim of this study is to answer the basic questions of who becomes ill, what they do, when and why and their satisfaction with these services in a representative sample from Erbil city. To achieve this goal, a community-based house to house study was conducted with a sample size of 1328 individuals. Satellite images and geographical information system were used to identify residential pattern that helped design a more representative sample. Data collection was done during the six months between January and June 2011. Principal Component Analysis was used to assign weight and develop an evidence-based socioeconomic scale.

The results showed that the overall rate of illness among the general population was 7.1% in the past two weeks and 16.6% in the past month prior to the interview. A minority did not seek external help but the majority (90.7%) did so and their choices of providers were: 44.8% consulted a private doctor clinic as their initial response to the illness and other providers included: 21.8%, 17.4%, 9.4% and 6.5% for nurse clinic, emergency department, primary health care centers and public health centers respectively. No one from the sample consulted traditional healer in the initial step but a significant minority (2.4%) did so when they did not get benefit from the first attempt. A similar proportion chose to travel abroad as their next choice of service provider. The findings from this study can help public health policy makers better understand the way people behave when becoming ill and help them plan for higher quality health services.

## **Cytotoxic and Cytogenetic effects of extracts of *Salvia officinalis* and *Pistacia khinjuk* on tumor cell lines**

**Name:** Reshna Kamal Ahmad Al-Barzanjy

**Degree:** Ph.D.

**Specialty:** Biology (Cytogenetic)

**Date of the Debate:** 23/5/2012

**Supervisor:** Assistant Professor. Asaad A. Al-Asady  
Assistant Professor. Kawa F. Dizaye

### **Abstract**

The search for novel anticancer drugs continues, agents that can eliminate the cancerous cells without harmful affect on normal cells may have a therapeutic advantage for the elimination of cancer cells.

In the present study, the cytotoxicity of *Salvia officinalis* (methanolic and aqueous) leaves extracts and *Pistacia khinjuk* (methanolic and aqueous ) leaves and seeds extracts were evaluated on two tumor cell lines Rbdomyosarcoma (RD), Murine mammary adenocarcinoma (AMN3), and one normal cell line, Murine fibroblast (L20B) cell lines in vitro The cytogenetic effects of *S. officinalis* extracts were studied after estimating the Cytotoxicity concentration 50% (CC50) value, on both tumor cell lines and human blood lymphocytes.

In vivo studies on adult male swiss albino Balb/C(*Mus musculus*) mice were carried out in order to estimate the cytogenetic and mutagenetic effects of *S. officinalis* extract after determining the Median Lethal dose (LD50) value.

The results of in vitro cytotoxic effect showed that aqueous and methanolic extracts of *S. officinalis* have concentration dependant effects on tumor cell lines at 48 and 72 hrs. The results revealed that high significant cytotoxic effect of both extracts was seen in highest concentrations on RD tumor cell line with CC50 5400 µg/ml for aqueous extract at 72 hrs of treatment and 5800 µg/ml for methanolic extract at 48 hr. The cytotoxic effect of extracts on AMN3 tumor cell line was with CC50 value of 7810 µg/ml for aqueous extract at 48hrs only. *Salvia officinalis* extracts induced a significant increase in L20B cell line proliferation. AMN3 tumor cell line was more sensitive to Cisplatin than RD tumor cell line.

The cytogenetic effect of aqueous and methanolic leaves extracts of *S. officinalis* showed a significant decrease in mitotic index in all concentrations on both tumor cell lines. The results of the present study revealed that both types of plant extracts caused a significant decrease in M.I and chromosomal aberrations of human blood lymphocyte at 48 hrs. However their cytogenetic effect was less than that of Cyclophosphamide (CP) group. The damage cell percentage was increased in all groups treated with different *S. officinalis* extracts and different types of chromosomal aberrations were detected in all groups, while 72hrs incubation of blood lymphocyte with different *S. officinalis* extracts showed non significant differences in M.I, damage cell percentage and chromosomal aberrations.

The results of in vivo studied after determination of LD50 of both aqueous and methanolic extracts of *S. officinalis* leaves, was 4361 mg/kg and 592.2 mg/kg respectively.

Cytogenetic studies showed significant decrease in mitotic index in all treated mice and with all types of *S. officinalis* extracts with different types of chromosomal aberrations. Cyclophosphamide displayed a high significant decrease in M.I in this group of the treated mice and the highest percentage of cytogenetic effects was observed in CP treated group.

The mutagenic effect of different concentrations of *S. officinalis* on micronucleus frequency was studied. The results showed that both extracts have non significant mutagenic effects. Non significant mutagenic effect was observed also in sperm abnormality assay.

Both of methanolic and aqueous (leaves and seeds) extracts of *P. khinjuk* significantly induced tumor cell lines and the normal cell line proliferation, especially in highest concentrations.

The results consigned us to study the mitogenic effects of highest concentrations of both methanolic and aqueous (leaves and seeds) extracts *P. khinjuk* on human blood lymphocyte culture.

The results show that the extracts induced significant increases in human blood lymphocyte proliferation at 72hrs. This activity of plant extracts recommends it as a good mitogenic agent in researches.

# **Analysis of Oncogenic Cell Receptors Status in Breast Cancer Images**

**Name:** Haidar Jalal Ismail

**Degree:** Ph.D.

**Specialty:** Biophysics

**Date of the Debate:** 8/5/ 2012

**Supervisor:** Assistant Professor. Salah Abu-Baker Ali  
Assistant Professor. Sardar Pirkhider Yaba

## **Abstract**

ER, PR, and Her2 are breast oncogene receptors that important for the growth of some organs. But their statuses for breast cancer patients are vital to determine chemo therapy after surgical removal of cancer. The present study aimed to estimate their status through Immunohistochemical slide images and through Electrophoresis serum protein patterns.

A computer program wrote by the Author (named HBCO Score) in Matlab language;compose of three codes, to study each type of receptors (nearly 10 slide images studied for each one). The program used pixel color classification techniques by using Artificial Neural Network (ANN). Also, serum protein patterns for eight cases (two control and six breast cancer patients) are studied through using bed electrophoresis.

Some image resizing, re-dimensioning, and enhancing are done by Photoshop program and that aimed to obtain better results of Proportion Observation percent (PO%) for ER and PR, and Pixel Proportion Observation percent (PPO%) for Her2. The PO% and PPO% estimated for receptors by two methods, routine test which was done by pathologist (manual scoring), and by the designed program used in this study (computer scoring). The two results were close to each other for ER and PR receptors and non-significant statistical evaluation confirmed that the program can be used as an objective method to confirm the subjective method.

The third codes modified to accompany the change in different staining the objects of Her2 receptor slide images (nucleus and the cytoplasm takes blue and red colors, respectively). The results of the two methods (estimating by pathologist scoring and the computer scoring) showed that the computed parameters PPO% could be used to make better interpretation.

The serum protein electrophoresis patterns of patients and normal cases showed, in general, increasing in Albumin peaks, lipoprotein deficiency in  $\alpha 1$  and  $\beta$  peaks and Hypogammaglobulinemia in  $\gamma$  peaks.

The two results are close to each other for ER, PR, and Her2 receptors and statistical evaluation confirms that the program can be used as an objective method to confirm the first method for the ER and PR. The HBCO Score program is better than the manual method for PO% and PPO% computation because it is an objective method and shows results in very accurate manner. The difference of the serum protein patterns for normal and patients mostly due to chemotherapy that have been given to the patients. The concentration of ER is in the (ng/dL) range, so it did not appear in patterns.

## **Embryonic Ontogeny of Lymphocytes**

**Name:** Tuqa Yousif Sharef

**Degree:** Ph.D.

**Specialty:** Embryology

**Date of the Debate:** 14/7/2012

**Supervisor:** Professor Kameel M. Naom  
Assistant professor. Salah A. Ali

### **Abstract**

This study was designed to follow up the normal growth of the leukocytes during gestation and to find out the relation ship between the different fetal blood sources, as well as the relation between the rate of raised leukocytes and their maturity and activity with the different gestational ages.

The study performed in the Maternity Teaching Hospital in Erbil city. The spontaneous aborted fetus samples aged between 8-29 weeks which were collected and dissected either in the laboratory of anatomy in college of medicine – Hawler Medical University, or in the forensic medicine institute –Erbil city. Tissue samples from liver, spleen, thymus and bone marrow of vertebra and sternum were sectioned and studied histologically using Haematoxylin and Eosin stain and immunohistologically using CD Markers (CD3, CD20, CD30, & CD45).

The results of this study showed highly significant differences between different hemopoietic organs tissue in different gestational ages as well as a significant differences between hemopoietic organs tissues in same gestational age.

Stem cells of leukocytes were seen in the liver, spleen, thymus and bone marrow in different gestational stages, but their rate, maturity and activities vary and changed according to their duration of development.

The results also demonstrated that the liver had a major role in leucopoiesis during early gestational ages. Spleen and thymus played as assistant role in formation of leukocytes especially lymphocytes until the bone marrow become the main producer of leucopoiesis at the last two months of gestation. In additions also it is demonstrated appeared that at this time, the thymus plays an important role in production of lymphocytes especially T- lymphocytes and its production levels of these cells continued without declining.

Taken together these finding indicate the presence of leucopoiesis in different fetal hemopoietic organs during gestation as well as the rate of the leucopoiesis vary according to the gestational development stages to follow up the necessity and requirement of fetus

## Mechanism of trans-translation as a target for Antibacterial agents

**Name:** Muhammad Ibrahim Muhammad

**Degree:** Ph.D.

**Specialty:** Medical Microbiology (Molecular Biology)

**Date of the Debate:** 1/8/2012

**Supervisor:** Assist. Prof. Farhad M. Abdulkarim Barzanji

### Abstract

In the present study three sites of mutation were made in tmRNA molecule by PCR based site directed mutagenesis, the first site was in the tRNA-like domain (TLD) by using a mutant forward primer tmLccF1 and the reverse (tmLccR1) and the second position mutation involved the mRNA-like domain (MLD) by another mutant primer, the forward MLH F2 and the reverse MLHR2. In both instances the SF1 plasmid containing wild type tmRNA gene was used as a template for amplification of entire plasmid sequence 4814 base pair by long PCR method. The third mutation involved both TLD and MLD regions of tmRNA that contained in SF1 plasmid by using the same mutant primers, the first constructed mutant TLD plasmid was used as a template for second round of PCR mutagenesis at MLD of tmRNA. As a result the three mutant strains MF1, MF2, and MF3 have been constructed.

For constructing  $\Delta$ tmRNA MG1655 E coli selective stain, the plasmid pKO3- $\Delta$ tmRNA was transformed into (recA+) lab strain MG1655 E. coli cells by allelic exchange event. The bacteria with lost vector were selected by screening for sucrose resistance and chloramphenicol sensitivity. The SsrA gene deletion was confirmed by colony PCR using two primers flanking the targeted open reading frame TSO F and TSO R. The parental SmpB-SsrA PCR products were measured about 1928 bp background, while the generated SsrA gene deletion in SmpB-SsrA was a round 1500 bp, this meant that the tmRNA gene was successfully been lost.

For evaluating the possible effect of mutations in SsrA, two methods were used to test the differences in the antibiotic sensitivity of variants MF1, MF2, and MF3 then comparing them with  $\Delta$ SsrA and wild type SsrA E coli MG1655 strains. First, a disk diffusion method was used to test three antibacterial agents Ampicillin (AM), Gentamycin (GM), and Ciprofloxacin (CF). The growth inhibition was considerably increased for strains with mutations in both sites MF3, and also for MF1 but to some extent for a strain MF2 when compared to the wild type strain. Second, the growth rates of mutant strains were determined by measuring the optical densities of cultures in minimal media and in presence of the same three antibiotics, all mutant strains shown relatively increased sensitivity than the wild type strain. Both MF1, and MF3 strains shown decreased sensitivity but MF2 was slightly less sensitive than  $\Delta$ SsrA strain.

For comparative analysis test between  $\Delta$ tmRNA and wild-type (WT) E coli strains in their growth inhibition and bactericidal activities to antibiotics, firstly disk diffusion test was used for measuring the growth inhibition of both strains in presence of 12 antibiotics targeting cell wall, protein synthesis, and nucleic acids, as a result the E coli strains that lacking tmRNA were more sensitive to antibiotics than the wild type particularly at stressful growth conditions. Secondly, the MIC for testing possible inhibitory differences

in the effects of GM, and CF, but observable difference was not detected in their sensitization to CF and GM.

Thirdly, the optical densities of bacterial growth were measured to compare the growth inhibition and to test bactericidal activities of both strains to various antibiotics at different concentrations. For growth inhibition test six antibacterial agents Ampicillin, Gentamycin, Ciprofloxacin, Norfloxacin, Chloramphenicol, and Ceftriaxone were used at different concentrations, as a result the measured optical density revealed that the growth of  $\Delta$ tmRNA strains were inhibited much more rapidly than that of WT strain. For bactericidal experiment, three antibacterial agents Ampicillin, Gentamycin, and Norfloxacin were tested for the viabilities of both strains. At determined time intervals the colony forming units (CFUs) were counted, so a weak difference is seen in the reproduction growth between the wild type and  $\Delta$ ssrA strains in absence of antibiotics. A small difference in viabilities of the wild-type and  $\Delta$ ssrA strains was detected when treated with Ampicillin. The survival rate of the wild-type strain was higher than that of the  $\Delta$ ssrA strains when grown with protein synthesis inhibitor Gentamycin. Relatively large variations in viability test were seen between the wild-type and  $\Delta$ ssrA strains for DNA synthesis inhibitor Norfloxacin and the viabilities of both strains were reduced much faster when they grew in the presence of Norfloxacin than they grown in the presence of Ampicillin and some what of Gentamycin.

# **Role of the Brain Renin-Angiotensin System in Salt-Induced Hypertension in the Rat**

**Name:** Dler Qader Omer Gallaly

**Degree:** Ph.D.

**Specialty:** Medical Physiology

**Date of the debate:** 27/11/2012

**Supervisor:** Prof. Salah Al-Din M.A. Merani

## **Abstract**

Considerable data indicate a significant role of dietary salt in the development of hypertension (HTN). The amount of salt in the body determines the volume of the extracellular fluid (ECF) that consequently triggers physiological mechanisms to regulate Na<sup>+</sup> balance, volume homeostasis and arterial BP. The most important of these mechanisms is the activity of the reninangiotensin system (RAS). Recent data also indicate that activation of the intrinsic brain RAS (BRAS) may contribute to the pathophysiology of HTN. The mechanisms that lead to activation of the BRAS and how it contributes to HTN are not clearly understood. Therefore experiments were designed, using Wistar albino rats, to investigate the effects of increased dietary salt intake and central hypernatremia on the activity of BRAS, and to evaluate any role of this system in salt-induced HTN by blocking brain angiotensin type 1 (AT1) receptors.

Rats were salt-loaded by giving them normal saline as drinking water for at least 2 weeks prior to experiments. Conscious normal and salt-loaded rats were chronically treated with the AT1 receptor antagonists Losartan, Telmisartan or Valsartan at a dose of 10 mg/kg/day given intraperitoneally (ip) for 10 days. Effects of the AT1 receptor antagonists on systolic BP (SBP) and heart rate (HR) were evaluated using a tail cuff transducer and a computerized powerlab system. The effects of intravenous (iv) infusion of angiotensin II (Ang II) at a rate of 50 ng/kg/min were also evaluated upon BP, HR and some kidney function parameters in rats which were anesthetized with a ketamine-xylazine combination, either completely or received half of the usual dose to induce light anesthesia. The BP and renal responses of salt-loaded rats to central hypernatremia, which was induced by intracarotid (ic) infusion of 5% hypertonic saline (HS), were recorded and the effects of an acute iv injection of Telmisartan (10 mg/kg) on these responses were evaluated during ethanol anesthesia and hypotonic (0.4%) saline diuresis. Salt loading significantly elevated BP. Chronic treatment of conscious normal and salt-loaded rats with comparable doses of Losartan or Telmisartan induced greater hypotensive effects than Valsartan. The iv infusion of Ang II produced almost similar increases in BP in normal and salt-loaded rats, but the level of BP rise was greater in salt loaded animals. Intracarotid infusion of HS significantly increased arterial BP accompanied by natriuresis. A bolus iv injection of Telmisartan caused rapid reduction in BP and significantly enhanced salt excretion and urine flow (UF) rate. This injection of Telmisartan during Ang II infusion totally abolished the pressor response to Ang II and further reduced BP significantly to a value lower than pre Ang II measurements. The arterial BP, UF rate and Na<sup>+</sup> excretion were relatively high during ethanol anesthesia and hypotonic saline diuresis. In these conditions, however, ic infusion of HS was still able to

induce further significant increases in these parameters. Intravenous injection of Telmisartan prior to and during ic infusion of HS completely inhibited the rise in BP, but it did not affect the renal responses. In conclusion, salt induced HTN appears to be well related to enhanced ECF concentration of Na<sup>+</sup>, volume expansion and increased peripheral resistance. The more pronounced hypotension induced by both Losartan and Telmisartan indicate their additive central AT1 receptor antagonism. In saltloaded animals, the already higher baseline BP indicates AT1 receptor upregulation. The mechanisms underlying the pressor and natriuretic responses to central hypernatremia are totally independent. The pressor response is secondary to the activation of the BRAS, as it was completely inhibited by Telmisartan, whereas the natriuresis is due the release of a natriuretic factor from the brain, most likely brain ouabain.

# **Small Group Teaching in Hawler College of Medicine: Challenges and Opportunities from Teachers and Students Perspectives**

**Name:** Abubakir Majeed Saleh

**Degree:** Ph.D.

**Specialty:** Community Medicine

**Date of the Debate:** 10/6/2013

**Supervisor:** Professor. Namir G. Al-Tawil

## **Abstract**

Although the medical colleges in Iraq started recently to increasingly use small group teaching approach, there is limited research about small group teaching in Iraq particularly in Kurdistan Region. Therefore, the aim of this study was to assess the small group teaching experience in Hawler College of Medicine and to identify its problems and needs as well as potential opportunities.

The study was conducted in Hawler College of Medicine from April, 2011 to April, 2013 employed a multimodal method. The first part included assessing the perspectives of 83 randomly selected teaching staff on the undergraduate medical curriculum in the college using open-ended questionnaire survey. The second part included assessing small group teaching experience from students' perspectives using focus groups involving 64 randomly selected students from the 4th, 5th, and 6th years study in the college. The third part included assessing small group teaching from teaching staff perspectives using semi-structured interview with 20 purposively selected staff. The fourth part included a quasi-experimental study to compare didactic lecture with problem solving interactive sessions in small groups among a sample of 72 sixth year students.

The participants were generally happy with applying small group teaching approach and recognized many positive aspects related to this experience. The main problems facing this experience included poor infrastructure, teaching methods in small group, and problems related to teachers' commitment and performance. The main suggestions to improve this experience included using more interactive teaching methods, changing the assessment system with focusing more on end course assessment, improving the infrastructure and teaching facilities and better organization and management of the system.

The quasi-experimental study revealed a better performance of students in study group than students in comparison group.

This study has provided a clear understanding of the factors that negatively affect the implementation of small group teaching from both teaching staff and students' perspectives that might signal the need for important and comprehensive improvements in different aspects.

# **Role of Procalcitonin and some Immunological Markers in Diabetic Foot Infections**

**Name:** Shler Ghafour Raheem

**Degree:** Ph.D.

**Specialty:** Medical Microbiology

**Date of the debate:** 27/6/2013

**Supervisor:** Assistant Professor. Ruqaya M. Al-Barzinji  
Assistant Professor. Ali A. Al-Dabbagh

## **Abstract**

This case control study was carried out between June 2011 and March 2012, in Rizgary, Emergency and Hawler Teaching Hospitals. A total of 130 diabetic patients were enrolled in our study, 90 of them (51 males and 39 females) suffered from diabetic foot lesion chosen as a patient group, their age ranged between 35 to 85 years old, 85 (94.4%) were type 2 diabetes. The other 40 diabetic patients without foot lesion with age and sex matched, chosen as a patient control. An additional group of 20 apparently healthy individuals chosen as healthy control. Foot lesions were graded according to Wagner classification system into 5 grades, 14 had grade I, 24 grade II, 25 grade III, 15 grade IV and 12 grade V. Assessment of procalcitonin, C-reactive protein, Interleukin-1 $\beta$ , Interleukin-6 and tumor necrosis factor- $\alpha$  were done in sera of patients and both controls. Wounds were also classified according to the Infectious Diseases Society of America/ International Working Group on the Diabetic Foot as infected and uninfected. Additionally, according to outcome of disease, patients were classified into patients with indication for amputation and patients without indication for amputation. Microbiological analysis revealed that 92% of patients had positive culture, of those, 41% were monomicrobial and 51 % were polymicrobial. Gram-positive bacteria 53.1% were seen to be slightly commoner isolates than gram-negative bacteria 46.9%. A total of 135 microorganisms were isolated. [Candida](#) albicans was observed in 5 patients. Staphylococcus aureus 23% was the bacterial species most commonly isolated. Anaerobic bacteria were isolated from 17 patients, Peptostreptococcus spp. constituted the highest incidence 47.05 %. Procalcitonin and the other immunological parameters were highly significantly increased in patients group. Linear increase in the procalcitonin and the other immunological parameters level were also significantly increased with Wagner's grading, infected foot and patients with indication for amputation as well. Regarding the relationship between studied biomarkers with the causal microbial agent, our result revealed an increase of the studied biomarkers in sera of patients infected with polymicrobial infection or gram-negative bacteria compared to those infected with monomicrobial infection or gram-positive bacteria.

# Antibiotic Resistant Studies and Curing ANALYSIS by Ascorbic Acid In *Pseudomonas Aeruginosa*

**Name:** Shukriyah Sewar Sulaiman

**Degree:** Ph.D.

**Specialty:** Medical Microbiology

**Date of the Debate:** 27/6/2013

**Supervisor:** Assist. Prof. Zirak Faqe A. Abdulrahman

## Abstract

In this study eight hundred samples of (wound, burn, cystic fibrosis) were collected from patients admitted to Emergency hospital, Hawler teaching hospital, Pediatric hospital and private laboratory in Erbil during the period of February to September 2011. One hundred isolates of *Pseudomonas aeruginosa* were identified by using cultural, morphological characteristics, biochemical test and Api 20NE system in addition to Vitek 2 system.

Results of pigments production revealed the ability of *Pseudomonas aeruginosa* to produce various pigments including blue/ green, yellow/ green, and brown/ blue .

The susceptibility of *Pseudomonas aeruginosa* isolates to different antibiotics was examined. Imipenem was the most effective antimicrobial agent against *Pseudomonas aeruginosa* isolates and most of isolates showed high resistance degree to Doxycycline 100%, Tetracycline 100%, Vancomycin 100%, Rifampicin 96%, Ampicillin 95%, Chloramphenicol 94%, Trimethoprim 83%, Amoxicillin 81%, Streptomycin 76%, Ceftriaxone 73%, Amikacin 67%, Cefotaxime 62%, Gentamicin 54%, and Ciprofloxacin 40%. According to the resistance of the isolates to these antibiotics they were classified into twenty five groups that showed the sensitivity variation in their resistance to these antibiotics.

The ability of *Pseudomonas aeruginosa* to produce biofilm were studied , and the results showed that among 91% of the isolates 71% were strongly biofilm producer, 20% were moderately biofilm producer, and 6% were weakly produced biofilm while 3% were non biofilm producer. All *P. aeruginosa* isolates were screened for their ability to produce  $\beta$ -Lactamase and Extended spectrum  $\beta$ -Lactamase, out of 100 of *P. aeruginosa* isolates 69% were found to produce  $\beta$ -Lactamase using rapid iodometric method, while 48% of the isolate were found to produce ESBL.

The plasmid profile for nine *Pseudomonas aeruginosa* isolates which showed the highest antibiotic resistance were conducted and the results revealed that all isolates except P6, and P8 contain one band with molecular weight more than 10kb using Agarose gel electrophoresis technique. The results indicate the dissemination of plasmid among *P. aeruginosa* isolates which may carry resistance gene against wide spectrum of clinically used antibiotics .

To determine the site of antibiotic resistance gene, genetic transformation was performed using laboratory strain *E coli DH5 $\alpha$*  with purified plasmid DNA from *Pseudomonas aeruginosa* isolates (P1, P4, P5), which represent the most resistant isolate. It appeared that all tested antibiotic resistance gene were plasmid DNA

born except Doxycycline and Ceftriaxone resistance gene which was appeared chromosomal born. This result was supported with gel electrophoresis.

The minimum inhibitory concentration of ascorbic acid against two more resistant isolates (P1 and P4) were determined, and the obtained MIC value was 1600µg for P1 and 1200µg for P4. The MIC of ascorbic acid was used as curing agent to eliminate antibiotic resistance gene. The results showed remarkable effect as MIC on reduction of antibiotic resistance gene which were as following:

- 1- The effect of MIC of ascorbic acid on antibiotic resistance gene including (Amoxycillin, Ampicillin, Amikacin, Cefotaxime, Ciprofloxacin, Chloramphenicol, Gentamicin, Imipenem, Streptomycin, Tetracycline, Trimethoprim, and Vancomycine) for isolate P1 showed reduction of the resistance genes from 5 - 100%. 5% for Imipenem, 100% for Ciprofloxacin .
- 2- The effect of MIC of ascorbic acid on antibiotic resistance gene including (Amoxycillin, Ampicillin, Amikacin, Cefotaxime, Ciprofloxacin, Chloramphenicol , Gentamicin, Imipenem, Streptomycin, Tetracycline, Trimethoprim, and Vancomycine) ) for isolate P4 showed reduction of the resistance gene from 15-70. 15% for Gentamicin , 70% for Cefotaxime .

# Effect of Female Age on the Diagnostic Categories of Infertility and on the Ovarian Reserve Markers to Predict Outcomes of Assisted Reproductive Technology

**Name:** Safiya Abdulkareem Wahd

**Degree:** Ph.D.

**Specialty:** Assisted Reproductive Technology (Art)

**Date of the debate:** 30-6-2014

**Supervisor:** Prof. Khalid Saeed Khan

Dr. Talha Al-Shawaf

Assistant Prof. Shahla Karim Alalaf

## Abstract

**Background and Objectives:** The etiologies of infertility are not similar in different parts of the world. A women's fertility is remarkably reduced with increasing age. Reproductive age and etiology of infertility affect ovarian reserve, which can be assessed by a number of ovarian reserve tests. In the first part of this study, the objectives were to determine the causes of infertility and to explore the association between age and diagnosed categories of female infertility. In the second part, the role of the ovarian reserve markers as predictors of assisted reproductive technology (ART) outcome in women having their first intracytoplasmic sperm injection (ICSI) cycle were assessed.

**Patients and methods:** This cross-sectional study included 1102 infertile couples investigated at the Maternity Teaching Hospital Fertility Centre (MTHFC) in Erbil, Iraq between July 1<sup>st</sup> 2011 and June 30<sup>th</sup> 2013. All the couples were fully assessed regarding the ovarian reserve markers. Laparoscopy performed for a group of the infertile women with specific indications. Four hundred ninety eight infertile women who had a first ICSI cycle were investigated regarding their cycle outcome.

**Results:** Polycystic ovaries syndrome was the cause of infertility in 30.3%, male factor was identified in 19.7%, and tubal damage was recognized in 15.4% of infertile couple. Endometriosis was laparoscopically confirmed in 17.7%. The rate of unexplained infertility was 16.6%. More women over 35 years had tubal factor infertility, compared with women less than 25 years. The lowest pregnancy rate was observed in women with previous endometrioma surgery. The best predictor of the number of oocyte retrieved was antral follicle count (AFC), while for the prediction of number of mature oocyte retrieved was AFC, followed by age then Anti-Müllerian hormone (AMH). AFC was the only independent predictor of live birth in women < 35 years. Serum AMH level was superior to AFC as a predictive index of live birth in women  $\geq$  35 years of age.

**Conclusions:** Women's age have a significant association with diagnostic categories of infertility. AFC is superior to female age in assessing the quantitative aspects of the ovarian reserve and it is the sole predictor of live birth in women < 35 years, but its value is much more limited in the prediction of live birth in women  $\geq$  35 years.

# **The Role of Health Research in Guiding the Current Health Policy in Iraqi Kurdistan**

**Name:** Sherzad Abdulahad Shabu

**Degree:** Ph.D.

**Specialty:** Community Medicine

**Date of the debate:** 28-3-2015

**Supervisor:** Professor Namir Ghanim Al-Tawil

Professor Rod Sheaff

Professor Michael Fuller

## **Abstract**

Evidence-based policy-making is an approach that helps people make well informed decisions about policies, programmes and projects by putting the best available evidence from research at the heart of policy development and implementation. As with the majority of developing countries and those countries in a post-conflict status, Iraq, including Iraqi Kurdistan, has witnessed a diminished role of research in health policy development and planning. The reasons for this poor role, whether from the policymakers' side or the researchers' side, are not clearly understood. This study was aimed at understanding the current context of the health policy-making in Iraqi Kurdistan, assessing the role of research on health policy-making in Iraqi Kurdistan context in order to identify the main barriers and facilitators for enhancing such role in health policy-making.

A cross sectional study was carried out in the three Governorates of Iraqi Kurdistan during the period February 2011 to September 2014. Semi-structured interviews with twelve key health managers and three parliament members, combined questionnaires for twelve health key informants and three health advisors, self administered questionnaire for 160 academic researchers and literature review methods were used in this study. Different data analysis methods were used including thematic analysis and Likert scale. SPSS, Version 19, was used to test statistical significance.

Results showed that health policy in Iraqi Kurdistan is formulated on an *ad hoc* basis responding to urgent needs and citizens were rarely involved in the process. More than 85% of the health policy and health system articles and theses in Iraqi Kurdistan have been produced since 2006 and almost half of the articles were published in international peer reviewed journals. Only 20% of key health managers stated that they directly consult researchers during their policy-making process, and stated that conferences/seminars, consultants and academic journals are the main sources of obtaining research evidence. The jargon used in articles (90%) together with the lack of tradition in collaborating (70%) were considered to be the main obstacles preventing policymakers consulting researchers. Consultants (90%), Scientific Committees (70%) and collections of specialists/advisors (70%) were suggested to be the main intermediary bodies between policymakers and researchers. Around 43% of academic researchers used less than 5% of their time in knowledge transfer and exchange activities. About three quarters of the respondents stated that they never or very rarely conduct knowledge transfer and exchange activities to the general public and civil society groups, just more

than a quarter of them deal with patients and their families whilst more than 60% never or rarely communicate with managers in health-care institutions and 90% do not communicate with public policymakers. Seventy percent have never or rarely provided target audiences with reprints or copies of articles published in scientific journals. Three quarters of them never or rarely reviewed research literatures or websites about knowledge transfer and exchange, and more than 80% of them never or rarely developed relationships with the media in either print, radio or television forms. Half of the respondents agree that the translation of research into action was hampered by the lack of academic rewards for knowledge transfer and exchange activities and around 75% of them disagreed with the fact that their organization has made financial and human resources available to assist them with knowledge transfer exchange activities.

There is poor utilization of local research evidence in health policy-making in Iraqi Kurdistan whereas more attention is increasingly paid to health policy/system research by the academic researchers in health. There is poor networking between researchers and policymakers in health policy-making, and there is a lack of a programme of funded research that can inform policy-making. There is an obvious shortfall from the side of academic researchers in knowledge transfer and exchange with relevant target audiences, and this is partly due to lack of proper interaction between these two groups, and also lack of the organizational support in this regard.

# **Effects of Combined Usage of Tamoxifen and L-Carnitine on the Abnormal Sperm Parameters of Non- Fertile Men in the Procedure Ofintracytoplasmic Sperm Injection**

**Name:** Milat Ismail Haje

**Degree:** Ph.D.

**Specialty:** In Assisted Reproductive Technology (ART)

**Date of the debate:** 20-4-2015

**Supervisor:** Prof. Kameel M. Naom  
Prof. Christopher Barratt

## **Abstract**

The aims are, to estimate and analyze the causes of male infertility at Maternity Teaching Hospital( Fertility and IVF Center) in Hawler City- Kurdistan-Iraq; to determine the effect of paternal age and smoking habits on basic semen parameters; to evaluate difference of three semen parameters between primary and secondary infertility; to investigate any influence of maternal and/or paternal age, three semen parameters, and paternal smoking habit on pregnancy outcomes in intracytoplasmic sperm injection and intrauterine insemination cycles; to evaluate the efficacy of a combination therapy with tamoxifen citrate and L-carnitine in treating idiopathic infertile male attended Intracytoplasmic Sperm Injection; to compare the clinical outcome after intracytoplasmic sperm injection between extracted testicular sperm or ejaculated oligoasthenoteratozoospermia sperm; and with fresh and cryopreserved testicular spermatozoa in patients with azoospermia.

This study includes two sections; section (1) was carried out retrospectively. Section (2) was done prospectively, randomized trial.

Results of this study showed strong association among the semen parameters, there were influential effects of age of male partner on sperm motility and morphology, significant difference of sperm parameters between primary and secondary male infertility. Pregnancy outcome after ICSI were influenced by the maternal, paternal partners age and sperm count. The combination therapy with tamoxifen and L-carnitine action leads to a significant improvement of semen parameters comparing with the single use of tamoxifen citrate, L-carnitine, and placebo group.

Clinical pregnancy rates according to women's age in IUI it was zero in group +40 years. The pregnancy outcome after intracytoplasmic sperm injection was 37.6% in all treatment groups, the highest pregnancy outcome was in the group tamoxifen A (48.9%) then group tamoxifen + L-carnitine C (48.3%). No significant difference in pregnancy rate after intracytoplasmic sperm injection with extracted testicular sperm or ejaculated oligo-astheno-teratozoospermic and between cryopreserved and fresh testicular sperm.

## Exploring Genotype-Phenotype Correlation in B-Thalassemia Intermedia in Erbil Province of Iraqi Kurdistan

**Name:** Rawand Polus Shamoon

**Degree:** Ph.D.

**Specialty:** Hematopathology

**Date of the debate:** 18-3-2015

**Supervisor:** Dr. Nasir A. S. Al-Allawi

Dr. Maria Domenica Cappellini

### Abstract

Thalassemia intermedia is a clinical term describing a range of clinical phenotypes that are intermediate in severity between the carrier state and thalassemia major. Many complex genetic interactions have been found associated with  $\beta$ -thalassemia intermedia phenotype, which are generally variable in the different geographical regions. Studies of the molecular background of thalassemia intermedia from the Middle East are scarce.

To characterize the molecular basis of  $\beta$ -thalassemia intermedia in Erbil, the capital of Iraqi Kurdistan region, 83 unrelated patients were investigated. Clinical data related to age at diagnosis, age at first transfusion and frequency of transfusion, were scrutinized. Hematological data and results of hemoglobin electrophoresis, together with serum ferritin levels were recorded. Detection of  $\beta$ -globin gene mutations was carried out by reverse-hybridization assay and direct gene sequencing. All patients were screened for the *XmnI* polymorphism by direct sequencing of *HBG2*. Detection of  $\alpha$ -globin gene deletions and triplication was carried out using multiplex gap-PCR and/or reverse-hybridization assay.

The median age at diagnosis was seven, ranged between 2 and 61 years; first cousin consanguinity was recorded among parents of 60.2% of cases. The mean hemoglobin was 8.8g/dl ( $\pm 1.4$ ); serum ferritin ranged between 35-5,978ng/ml with median of 616. At time of enrollment, 21 patients (25.3%) were never transfused and 19 (22.9%) were splenectomized. Both splenectomy and serum ferritin significantly correlated with patients' age and frequency of transfusion. Fourteen different  $\beta$ -globin gene mutations were detected among the studied patients and four main molecular patterns were identified in association with thalassemia intermedia phenotype, namely:  $\beta^+/\beta^+$  (38.5%),  $\beta^+/\beta^0$  (21.6%),  $\beta^0/\beta^0$  (31.3%), and  $\beta^0/\text{wild}$  (8.4%). IVS-I-6 (T>C) was the most frequently encountered mutation (55 alleles, 34.6%), followed by IVS-II-1 (G>A) and codon 8 (-AA); furthermore, we report and for the first time from Iraq two  $\beta^+$  mutations -87 C>G and 5'UTR +22 G>A. *XmnI* polymorphism was detected in 47% of patients, mainly in association with  $\beta^0/\beta^0$  genotype.  $\alpha$ -globin gene deletions were encountered in four cases, including one case with (--<sup>FIL</sup>) double gene deletion, a report which is the first from our country.  $\alpha$ -globin gene triplication was detected in five of the seven heterozygous  $\beta$ -thalassemia. No significant clinical and hematological differences were observed among the four genotype groups.

Genetic analyses revealed that inheritance of mild  $\beta$ -globin mutations was the main molecular mechanism underlying  $\beta$ -thalassemia intermedia in our patients followed by the ameliorating effect of *XmnI* polymorphism. Two  $\beta^+$  mutations together with one

double  $\alpha$ -gene deletion were reported for the first time in Iraq. Apparent diversity of patients' clinical phenotype was observed. Requirement for blood transfusion and splenectomy increased with age. There was no comprehensible relation between phenotype severity and the genetic background.

# The Impact of Introduction of Quantitative-PCR on Management Decisions and Outcomes of Chronic Myeloid Leukemia in Iraqi Kurdistan Region

**Name:** Mohamed Daher Ali

**Degree:** Ph.D.

**Specialty:** Internal Medicine/ Clinical Hematology

**Date of the debate:** 2-4-2015

**Supervisor:** Dr. Nasir A. S. Al-Allawi & Dr. Anna Maria Testi

## Abstract

**Background:** Chronic Myeloid Leukemia (CML) is a myeloproliferative clonal disorder caused by the *BCR/ABL* gene rearrangement, leading to a protein product with tyrosine kinase activity. Imatinib was the first Tyrosine Kinase Inhibitor (TKI) used in a clinical setting. It prevents a *BCR/ABL* protein from exerting its role in the oncogenic pathway in chronic myeloid leukemia (CML). The aim of oral tyrosine kinase inhibitor (TKI) treatment in chronic myeloid leukemia (CML) is to get ideal hematological, cytogenetic, molecular responses at the critical time points. The high efficacy of the TKI treatment of CML has prompted the need for accurate methods to monitor response at levels below the landmark of CCyR (complete cytogenetic responses). Quantification of *BCR/ABL* transcripts has proved to be the most sensitive method available and has shown prognostic impact with regard to progression-free survival.

**Patients and Methods:** To address the latter issue we evaluated and monitored a cohort of 108 Iraqi patients diagnosed as chronic phase-CML, enrolled in a government-sponsored national program from Hawler, Sulaimaniya and Duhok in the Kurdistan region of Iraq. The patients were all treated initially by Imatinib mesylate.

**Results:** Ninety-two percent of patients had a complete hematological response, by 12 months' time point, 55% had CCyR, 79 % had a major cytogenetic response, while 41% had a major molecular response. After a median follow-up of 35.7 months, the 3-year Event-Free, Progression-Free, and Overall survival rates were 79.6%, 87% and 98.1 %, respectively. A total of 26 patients (24.1 %), 9 had CCyR but failed to achieve MMR at more one year, 9 failed to achieve CHR (Complete hematological responses), and 8 failed to achieve Major cytogenetic response (MCyR) at one year, were shifted to an alternative TKI (Nilotinib) according to the

# Metabolic Syndrome among Infertile Women with Polycystic Ovary Syndrome: A Hospital Based Study

**Name:** Avin Sadiq Jamil

**Degree:** Ph.D.

**Specialty:** Assisted Reproductive technology

**Date of the debate:** 20-9-2015

**Supervisor:** Assistant Prof. Shahla Karim Alalaf

**External supervisors:** Prof. Khalid Saeed Khan  
Dr. Talha Al-Shawaf

## Abstract

**Background and objectives:** Polycystic ovary syndrome (PCOS) is the most common endocrine disturbance in women in reproductive age associated with numerous reproductive and metabolic abnormalities. The main objective of this study was to determine the prevalence and the risk for metabolic syndrome (MetS) and insulin resistance (IR) in PCOS women and in different PCOS phenotypes in comparison with non-PCOS women (controls).

**Methods:** In this case-control study, 263 PCOS infertile women and 263 control infertile women were included. Women presented with primary or secondary infertility to the outpatient gynecology clinic or attending the fertility centre of the Maternity Teaching Hospital, Erbil in Kurdistan Region of Iraq between 1<sup>st</sup> of April 2012 to the 30<sup>th</sup> of June 2013 were recruited. The prevalence and risk of MetS and IR were compared in both study groups and in the four PCOS phenotypes. Data were analyzed using the SPSS, version 19, to test statistical significance.

**Results:** PCOS women had a significantly higher prevalence of MetS and IR (53.6% and 42.6%, respectively) than controls (32.7% and 17.1%, respectively). No significant difference in the prevalence of MetS and IR among women with different PCOS phenotypes was demonstrated. Women with PCOS had a 2.4 fold and 3.6 fold increased risk of MetS and IR than controls, respectively. PCOS women with phenotype A (oligo-anovulation (O) + hyperandrogenism (H) + polycystic ovary morphology (P)) and B (O+H) had nearly three-fold and more than eight fold risk for MetS than controls, respectively. However, phenotypes C (H+P) and D (O+P) have no significant risk for MetS in comparison with controls. PCOS phenotypes A, B and C have a four-fold increased risk of IR, while phenotype D had only two-fold increased risk in comparison with controls. Anti-Mullerian hormone level had no association with MetS while it was negatively associated with IR in PCOS women. The best predictors for MetS in PCOS women were waist circumference, homeostatic model assessment-IR, and triglycerides / high density lipoprotein- cholesterol.

**Conclusion:** The prevalence of MetS in PCOS women was higher than that reported in neighboring and western countries. The prevalence and risk for MetS and IR was significantly higher in PCOS women than controls, with variations in the risk among women with different PCOS phenotypes in comparison with controls. Women with four PCOS phenotypes have more or less similar prevalence and risk for MetS and IR.

# **Bacteriological Study on Urinary Tract Infections in Women with Some Aspects of Innate Immune Responses**

**Name:** Mohammed Hassan Fatah

**Degree:** Ph.D.

**Specialty:** Medical Microbiology

**Date of the debate:** 6-8-2015

**Supervisor:** Assistant Professor. Nabeel E. Waheda  
Assistant Professor. Dik J. Kok

## **Abstract**

Urinary tract infections are among the most common bacterial infection. Millions peoples suffering this infection symptoms visit hospital every year costing billion dollars. Studying the causes, urinary bacterial Microbiome and some innate immune responses to urinary tracts infections are the objects of this work.

This study has been done on 225 urine samples collected from 150 participants attending the General hospital and "Sherae Naqeeb" women and obstetrics hospital labs in Kalar City-Kurdistan Region / Iraq during the period of April 2012 - July 2013. The participants in this study were divided in two groups; Patients who were suffering from infection as a test group (Set of 75 urine samples during the infection and another set after two months) and control group (Set of 75 urine samples). Each group was equally divided into three sub groups (Girls, Pregnant and Postmenopausal women).

The isolated bacteria were identified by MALDI-TOF technique, the urinary microbiomes were studied by molecular gene sequencing (16srDNA) and the urinary innate immune factors were estimated by ELISA technique.

The most identified pathogens causing urinary tract infections across the study were ***Escherichia coli* 32%**, ***Proteus mirabilis* 17%** and ***Staphylococcus saprophyticus* 15%** respectively.

The results of studying the urinary Microbiome showed disruption in the urinary Microbiome during the infection compared to control groups.

The results of studying the urinary interleukine-8, tumor necrosis factor- alpha, lactoferrin showed significant increasing during the infection compared to control groups and significant decreasing after two months from the treatment, while the changes in urinary C-reactive protein, complement components 3 & 4 were not significant.

# Characterization of Human Coronaviruses From Children with Respiratory Infection in Erbil - Kurdistan Region of Iraq

**Name:** Dlshad Abdullah Hassan

**Degree:** Ph.D.

**Specialty:** Molecular Virology

**Date of the debate:** 5-10-2015

**Supervisor:** Professor. Shwan K. Rachid  
Professor. John Ziebuhr

## Abstract

Respiratory viral infections are considered a major cause of morbidity and hospitalization in many parts of the world. To date, very limited information is available on the role of specific viruses in causing acute respiratory tract infections (ARTIs) in children in the Kurdistan region of Iraq.

In this study, clinical samples (Nasopharyngeal swab, throat swab, and blood) obtained from 269 hospitalized patients (<15 years) with ARTIs that had been admitted to the Emergency Unit of the Raparin Pediatric Hospital, Erbil, Iraq, between February 2012 and April 2013. The samples were assayed for 18 respiratory viruses using the Luminex xTAG Respiratory Virus Panel Fast Assay.

One or more respiratory virus(es) were detected in 202 (75.1%) of the samples, of which 59.4% were single infections and 15.6 % were co-infections with 2 or more viruses. The most common viruses detected in these samples were entero-/rhinoviruses (32.7 %), respiratory syncytial virus (20.4%), and human metapneumovirus (13.3%) while, for example, human coronaviruses (HCoV) could only be identified in a single case. Enterovirus/rhinovirus-positive samples along with suitable controls were subsequently used to validate and further optimize a set of highly degenerate pan-enterovirus/rhinovirus-specific primers developed by the Gorbalenya laboratory at Leiden University Medical Center.

RNA isolated from the single HCoV-NL63-containing clinical sample was used to amplify the coding sequences of 2 nonstructural proteins (nsp8 [putative primase], nsp5 [3C-like protease]), and the nucleocapsid (N) protein of this virus. The amplicons were cloned into suitable plasmid vectors and recombinant forms of the viral proteins were expressed in *Escherichia coli*. The proteins were purified by affinity and ion exchange chromatography and used in subsequent seroepidemiological and biochemical studies.

Recombinantly expressed N proteins of HCoV-229E and HCoV-NL63 were used to develop an ELISA suitable to detect coronavirus N protein-specific antibodies in clinical samples. Using this newly established assay, seropositivity for HCoV-NL63 and HCoV-229E was confirmed for 69% and 65.5%, respectively, of the serum samples included in this study.

Taken together, the study provides important information on the major viral pathogens causing severe respiratory illness in children in Kurdistan.

Furthermore, the protocols and tools developed in this work may be used for further biochemical studies of coronavirus proteins as well as epidemiological studies of coronavirus and enterovirus/rhinovirus infections

# **Serum Level of Anti- Mullerian Hormone as a Predictor of Intracytoplasmic Sperm Injection Outcome in Infertile Women with and Without Polycystic Ovary Syndrome**

**Name:** Chimani Khudhur Mawlood

**Degree:** Ph.D.

**Specialty:** Assisted Reproductive technology

**Date of the debate:** 5-11-2015

**Supervisor:** Prof. Khalid Saeed Khan

Dr. Talha Al-Shawaf

Assistant Prof. Shahla Karim Alalaf

## **Abstract**

### **Background and objectives:**

The association of Anti-Mullerian hormone with pregnancy and its use as a predictor for pregnancy outcome after assisted conception remain controversial. The main objective of this study was to determine the association of serum AMH level with the ovarian response and pregnancy outcome in women with polycystic ovarian syndrome in comparison with polycystic ovarian morphology in normal women and women without PCOS or PCOM (infertility controls). The other objective was to evaluate the use of serum AMH as a predictor of IVF outcome in women having their first intracytoplasmic sperm injection cycle.

### **Methods:**

This case- control study included 190 women with confirmed PCOS, 50 women with PCOM and 248 infertility control women. ICSI was done for all infertile patients investigated at the Maternity Teaching Hospital Fertility Centre in Erbil, Iraq for one year in between April 1st 2012 to March 31st 2013. Data on demographic characteristics, hormonal, and biochemical variables were collected. ICSI outcomes were also recorded in the questionnaire.

### **Results:**

AMH was significantly higher in PCOS and PCOM than in infertility controls ( $P < 0.001$ ) and its level was declining with age in all infertile women. Significantly higher levels of AMH were observed in PCOS women, and PCOM than in infertility controls with positive fertilization, chemical and clinical pregnancy and live birth. AMH levels positively correlate with the number of retrieved oocytes in all patients also predicted the number of retrieved oocytes in infertility controls and PCOS patients and predicted mature (MII) oocyte rate in all patients. Pregnancy rate was higher in PCOS (37.6%) and PCOM controls (42.9%) than infertility controls (27.8%). AMH predicted both chemical and clinical pregnancy ( $P = 0.04$  and  $0.03$ , respectively) in infertility controls only, but it did not predict live birth in all study groups.

**Conclusion:**

AMH predicts the MII oocyte rate in all groups. Although AMH levels are higher in PCOS and PCOM patients with positive chemical, clinical pregnancies and live birth, AMH predicts pregnancy rates only in infertility controls and it does not predict live birth in all groups.

# **Molecular Characterization of B-Lactam Resistant Acinetobacter Baumannii and Pseudomonas Aeruginosa Isolated From Patients in Erbil City- Kurdistan Region**

**Name:** Aryan Rzgar Ganjo

**Degree:** Ph.D.

**Specialty:** Medical Microbiology

**Date of the debate:** 19-11-2015

**Supervisor:** Dr. Isam Yousif Mansoor & Dr. Wil H. F. Goessens

## **Abstract**

Multi-drug resistant bacteria is the major clinical and public health problem worldwide. A total of 741 clinical samples collected from burn, urine, skin soft tissue wounds, and other specimens from 3 different hospitals in Erbil and including: 160 isolates (60 *Acinetobacter baumannii* and 100 *Pseudomonas aeruginosa*), all isolates then transferred to Erasmus University, Rotterdam-The Netherlands for further study.

Most isolates of *Acinetobacter baumannii* showed high resistance to different antibiotics tested by disc diffusion method especially the carbapenem drugs. Analysis of occurrence of OXA-Type encoding genes is revealed that the blaOXA-51-like gene was detected in all of the isolates. The majority of strains were simultaneously positive for blaOXA-23-like, isolates rarely possessed blaOXA-24-like and any blaOXA-58-like encoding genes were not revealed among the isolates. The ISAbal was detected in (96.6%) of isolates. The co-existence of ISAbal/blaOXA-23-like was detected in (80%) of the isolates. The relatedness among the isolates were confirmed genotypically in isolates that obtained from different source.

The great majority of the *Pseudomonas aeruginosa* isolates were multiple resistant to more than one antimicrobial agents, colistin was the most effective antibiotic followed by ciprofloxacin. However, they showed high rate resistance to other antibiotics used in the study. The isolates were evaluated for blaOXA-10, 38.2% of the isolates had blaOXA-10 gene, one isolate was positive for blaVEB and none of them had blaPER, blaGES and blaBEL. The isolates were classified in clones that belonged to different clusters. Pulsed field gel electrophoresis analysis revealed a high degree of genetic relatedness in between isolated bacteria.

This study highlights the high prevalence of multi-drug resistant among *Acinetobacter baumannii* and *Pseudomonas aeruginosa* in the clinical setting in Erbil as well as the presence of an epidemiological relation between isolates in the presence of clusters, sharing of an identical clone.

