

## **In Hospital outcomes of acute coronary syndrome with atypical presentation in Hawler Teaching Hospital**

Jutyar Aziz Hussein\*, Abdulkareem Abdulwahab Al-Othman\*\*

### **Abstract**

#### **Background and objectives:**

Few studies have highlighted in hospital outcomes of acute coronary syndrome in patients presenting with atypical symptoms.

This study was conducted to evaluate the role of atypical presentation of acute coronary syndrome on early in-hospital mortality, arrhythmias, cardiogenic shock, Global Registry of Acute Coronary Events risk score, as well as early systolic dysfunction and ischemic mitral regurgitation.

#### **Methods:**

In a prospective study consisted of 100 consecutive patients (67 male, 33 female), their mean age ( $57.53 \pm 12.3$ ) years with first acute coronary syndrome who had been admitted to the Coronary Care Unit at Hawler Teaching Hospital from April 2015 to December 2015 were enrolled in these study.

Patients with atypical presentation of acute coronary syndrome were labeled as group A (31 patients) and those with typical presentation were labeled as group B (69 patients).

#### **Results:**

In hospital complications including serious arrhythmias, cardiogenic shock, mortality high Global Registry of Acute Coronary Events risk score, early ischemic mitral regurgitation and early Left ventricular systolic dysfunction were significantly higher in group A versus group B.

#### **Conclusion:**

Atypical presentation of acute coronary syndrome considered as a high risk for early in hospital mortality, serious arrhythmias, cardiogenic shock, high Global Registry of Acute Coronary Events risk score, early left ventricular systolic dysfunction and ischemic mitral regurgitation.

**Key words:** Acute coronary syndrome

## Introduction

Acute coronary syndrome (ACS) covers a wide spectrum of clinical presentation and the main cause of increased morbidity and mortality worldwide<sup>1</sup>. According to latest world health organization (WHO) data published in 2015, ischemic heart disease is the leading cause of death in Iraq, it kills 27.5 thousand people annually. Iraq is in rank 22 among other countries in which there is highest mortality related to coronary artery disease<sup>2</sup>, even though still we lack accurate data registration in Iraq including Kurdistan region.

Chest pain has been regarded as the most frequent characteristic symptom of acute coronary syndrome, however in some patients the pain might be located in atypical areas, like upper abdomen, shoulder, neck, back or may present with fainting or only shortness of breath.

Patients who present with atypical symptoms are frequently misdiagnosed or lately diagnosed and less likely to receive optimal treatment for ACS. Consequently greater in-hospital morbidity and mortality are noted<sup>3</sup>.

Few studies have highlighted the clinical significance and in hospital outcomes of ACS in patients presenting with atypical symptoms. In one cohort study in gulf region, 6704 patients presenting with ACS enrolled and categorized into three groups (typical, atypical, dyspnea) in hospital outcomes and mortality were worse in atypical and dyspnea group<sup>4</sup>.

However up to our best knowledge, there were no published studies in Iraq, to study in hospital outcome of ACS with atypical presentations. This study sought to assess in hospital outcome of ACS in patients presenting with atypical symptoms including, mortality, arrhythmias, cardiogenic shock, GRACE risk score, as well as early systolic dysfunction and ischemic mitral regurgitation diagnosed by two dimensional transthoracic echocardiography.

## Methods

This is a prospective study done on 100 patients with first time ACS who had been admitted to the coronary care unit (CCU) at Hawler Teaching Hospital from April 2015 to December 2015.

The inclusion criteria were any patients who diagnosed with ACS for first time, in whom duration of symptoms less than 24 hours.

Patients with left bundle branch block, previous history of ischemic heart disease, heart failure, valvular heart disease, rheumatic heart disease, congenital heart disease, chronic kidney disease

and patients who underwent percutaneous coronary intervention or coronary artery bypass graft were excluded from the study.

ST-segment elevation myocardial infarction (STEMI) was confirmed by 2mm ST elevation or more in chest leads or  $\geq 1$ mm ST-segment elevation in two or more limbs leads with raised cardiac enzymes. Patients who had ST-T changes with raised cardiac enzymes were labeled as non-ST segment elevation myocardial infarction (NSTEMI) while negative cardiac biomarkers with ST-T changes had been regarded as unstable angina (UA)<sup>5</sup>.

Risk factors for ischemic heart disease including, diabetes mellitus, hypertension, smoking, alcohol consumption, obesity and family history of ischemic heart disease were recorded, also physical and systemic examination had been done for all the patients. Laboratory studies had been done for all patients, including resting electrocardiography (ECG), cardiac enzyme, random blood sugar and renal function test.

Transthoracic two-dimensional color Doppler echocardiography had been performed for all patients within 4 days of admission to the CCU using Vivid S9 GE (2015). Ejection fraction (EF%) was determined by 2D guided M-mode approach<sup>6</sup>. Left ventricular systolic dysfunction (LVSD) in patients without ischemic mitral regurgitation (MR) defined, as left ventricular EF% of  $\leq 50\%$ , and  $\leq 60\%$  in the presence of moderate to severe mitral regurgitation<sup>7</sup>. Vena contracta  $< 3$ mm considered as mild mitral regurgitation, while vena contracta  $> 6$ mm considered as severe mitral regurgitation<sup>8</sup>.

Patients classified according to their main presenting symptoms in to two groups, Group A patients with atypical symptoms, like epigastric pain, indigestion symptoms, diaphoresis, dyspnea, collapse, silent presentation. Group B patients with typical presentations of ACS like ischemic chest pain with or without radiation to arm, shoulder and jaw, with or without associated symptoms like nausea, vomiting and sweating.

The two groups were evaluated and compared according to the baseline characteristics of the study population, in-hospital outcomes (defined as arrhythmias, cardiogenic shock, mortality), GRACE risk score, LVSD and ischemic mitral regurgitation diagnosed by transthoracic two dimensional echocardiography.

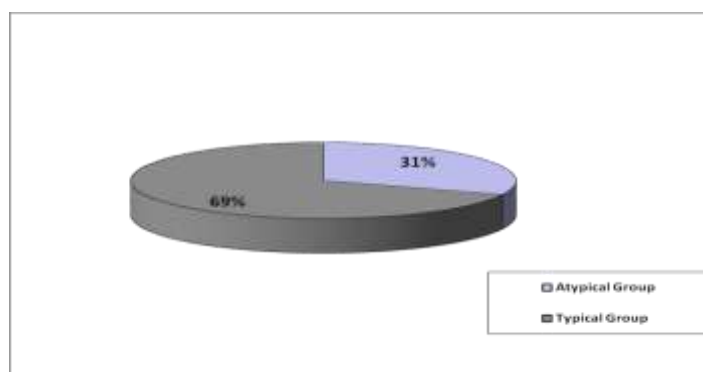
Our patients were also classified according to GRACE risk score system to low score ( $\leq 108$ ), intermediate score (109-140), and high score ( $\geq 140$ ) risk groups, for early hospital prognosis<sup>9</sup>.

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

The data analyzed by Statistical Package for Social Sciences (SPSS) version 22 and the results compared between patients with different variables, with a statistical significance level of  $< 0.05$ . T-test and Chi square test were performed to compare between both groups.

## Results

The total study group consisted of 100 patients with first time ACS, in which 67% male and 33% female; their age ranging from 25-78 year, mean age was  $(57.53 \pm 12.3)$  year. Atypical presentation of ACS was detected in 31 (31%) patients as shown in figure-1.



**Figure 1. Frequency rate of acute coronary syndrome with atypical presentation**

Patients with atypical presentation of ACS were older compared to those with typical chest pain,  $P=0.002$ , there were also significant statistical association between both groups in relation to hypertension, diabetes, and thrombolytic therapy. Patients with atypical presentation of STEMI, group A were less likely received thrombolytic therapy (16.7%) versus (100%) STEMI, group B,  $P= 0.0001$ . There was no significant difference in the incidence of smoking, alcohol consumption, obesity, family history of IHD, gender and the types of ACS between two groups, as shown in table-1.

**Table 1: Baseline characteristics of patients with typical and atypical presentation**

Variables	Group A (No.31)	Group B (No.69)	P value
	No.(%)	No.(%)	
Mean age ( $\pm$ SD) year	61.81 $\pm$ 12.1	53.26 $\pm$ 12.6	0.002*
Male, NO.67	18(58.1%)	49(71.0%)	0.20
Female, NO.33	13(41.9%)	20(29.0)	
Hypertension	20(64.5%)	24(34.8)	0.006
Diabetes mellitus	19(61.3%)	14(20.3%)	0.0001
Smoking	16(51.6%)	35(50.7%)	0.93
Alcohol	2(6.5%)	12(17.4%)	0.14
Obesity	5(16.1%)	20(29%)	0.17
Family history	3(10%)	16(23.2%)	0.12
STEMI	12(38.7%)	38(55.1%)	
NSTEMI	18(58.1)	25(36.2%)	0.10
UA	1(3.2%)	6(8.7%)	
Thrombolytic therapy	2(6.5%)	38(55.1%)	0.0001
	16.7% in STEMI	100% in STEMI	

Group A patients had higher mean random blood sugar (196.68 $\pm$ 92.350) and serum troponin (8.23748.275) compared with group B (149.30  $\pm$  62.546) and (4.7160 $\pm$ 5.010) respectively with significant statistical difference. Mean serum creatinine of atypical group (2.3090 $\pm$ 1.5082) was higher than typical group (1.0654 $\pm$ 05442) but without statistical significant, as shown in table-2

**Table 2: Basic investigations of both atypical & typical presentation**

Variables	Group A N:(31)	Group B N:(69)	P value
Mean RBS (mg/dl)±SD	196.68±92.35	149.30 ±62.54	0.003
Mean S.Troponin I (ng/dl) ±SD	8.2374±8.27	4.7160±5.01	0.01*
Mean S. creatinine (mg/dl)±SD	2.30±1.50	1.06±054	0.31

In-hospital outcomes were higher among group A in the form of serious arrhythmias (42%), cardiogenic shock (45.2%) and death (10%), compared to group B (0.0%), (2.9%), (0.0%) respectively, (Table3).

**Table-3: In-hospital outcomes in patients with typical and atypical presentation**

Complications	Group A No.(%)	Group B No.(%)	P value
Arrhythmias	VF, VT	13(41.9%)	0(0%)
	AF, SVT	7(22.6%)	2(2.2.9%)
Cardiogenic shock	14(45.2%)	2(2.9%)	0.001*
Mortality	3(9.7%)	0(0%)	0.01*

Seventy one percent of patients in group A had high GRACE risk score, compared with 10.1% of group B, While 63.8% of patients with typical symptoms (group B) had low GRACE score compared with 3.2% of group A, P=0.001, as shown in table -4.

**Table 4: GRACE score in relation to both groups**

GRACE score	Group A	Group B	P value
	No.(%)	No.(%)	
Low	1(3.2%)	44(63.8%)	0.001*
Intermediate	8(25.8%)	18(26.1%)	
High	22(71%)	7(10.1%)	

A high frequency rate of early LVSD diagnosed by transthoracic two-dimensional echocardiography recorded among group A (58%) as compared with group B (7.2%), p=0.0001. The mean ejection fraction of group B (65.07±8.4) was higher than that of group A (49.13±7.1), P=0.001, table-5.

The incidence of early severe ischemic MR was significantly higher among group A (6.5%) compared with group B (0.0%), P value of 0.001, as shown in table-5.

**Table 5: Comparison of both groups in relation to ischemic mitral regurgitation and left ventricular systolic dysfunction**

Variables	Group A	Group B	P value
	No. 31	No.69	
Mean EF% ± SD	49.13±7.1	65.07±8.4	0.001*
Ischemic MR	No	52(75.4%)	0.001*
	Mild	17(24.6%)	
	Severe	0(0%)	
LVSD	No	64(92.8%)	0.0001*
	yes	5(7.2%)	

## DISCUSSION

In this study the prevalence of atypical presentations of ACS was 31%, which exceeds the results of gulf region in which 17% of them showed atypical presentation<sup>4</sup>, also our results were in parallel to canto-et al, a study done in United States in which 33% of them were atypical<sup>10</sup>.

Patients with atypical presentations of ACS were older compared to those with typical chest pain consistent with a study done in japan<sup>11</sup>.this can explained by presence of multiple co morbidities in elderly, as well as reduced pain perception in elderly population.

The frequency of diabetes mellitus, as well as mean random blood sugar in group A were higher among (group-A) compared with (group-B), this is in agreement with a studies done by Kim Hyun kuk et al<sup>12</sup> and Ruano et al<sup>13</sup>, this can be explained by autonomic neuropathy and prolongation of anginal perception threshold among diabetic patients with atypical presentation of ACS.

Hypertension was higher among group A compared with group B, similar to Hirakawa et al<sup>14</sup>, a study done in Japan which shows higher prevalence of hypertension among patients with ACS who presents with atypical chest pain, this can be explained by the fact that most our patients with atypical presentation were older compared to patients with typical chest pain and most of them having diabetes mellitus as well.

The mean serum troponin I level was higher in (group-A) versus (group-B), in agreement with Hadi et al<sup>15</sup>, which may be explained by late presentation and more myocardial damage among ACS patients with atypical presentation.

This study showed higher incidence of arrhythmias and cardiogenic shock among (group-A) compared to (group-B), in agreement with a study done in poland<sup>16</sup>, which could be explained by late hospital admission of ACS patients with atypical presentation.

Mortality was higher among (group-A) versus (group-B), this is in agreement with Hirakawa et al<sup>14</sup>, which could be explained by high frequency rate of diabetes mellitus, hypertension among patients with atypical presentation.

In the present study group A recorded high GRACE risk score versus group B . Similar finding had been observed in Hwang S.Y, et al<sup>17</sup>.



Higher frequency rate of early LVSD reported among patients with atypical presentation of ACS as compared with typical presentation, no previous large scale studies done to evaluate the role of atypical presentation of ACS on early left systolic function. The incidence of ischemic mitral regurgitation among (group-A) patients was higher than (group-B), this is in agreement with Pant, *et al*<sup>18</sup>, a study done in USA which showed that ischemic mitral regurgitation following ACS is more common in elderly, diabetics mellitus and hypertensive patients, also Spain study<sup>19</sup> concluded that ischemic mitral regurgitation even if it's mild is associated with poorer long-term prognosis.

### **Conclusion**

Atypical presentation of ACS considered as a high risk for early in hospital mortality, serious arrhythmias, cardiogenic shock, high GRACE risk score, early LVSD and ischemic mitral regurgitation.

### **Conflicts of interest**

The authors report no conflicts of interest.

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\*MB,Ch,B.KBMS (Internal Medicine), Department of Medicine, Hawler Teaching hospital, Erbil, Iraq, e-mail: [jutyaraziz@yahoo.com](mailto:jutyaraziz@yahoo.com), Mobile: +0964 7504151837

\*\* **Corresponding author.** MB,Ch,B. FICMS, Professor of Medicine, Department of Medicine, College of Medicine, Hawler Medical University, Erbil-Iraq, E-mail: [kareem.abdulkarim@gmail.com](mailto:kareem.abdulkarim@gmail.com) Mobile: +0964 750 427 8097,