



## CLINICAL AND ELECTROCARDIOGRAPHIC PROFILE OF PATIENTS PRESENTING WITH ACUTE CORONARY SYNDROME IN EMERGENCY DEPARTMENT IN A TERTIARY CARE HOSPITAL.

Zahid Mahmood<sup>1</sup>, Tariq Feroze Khawaja<sup>2</sup>, Anjum Iqbal<sup>3</sup>, Abdul Rashid Khan<sup>4</sup>, Naveed Arshad<sup>5</sup>

1. MBBS, M.Phil (Biochemistry), Assistant Professor Biochemistry Wah Medical College.
2. MBBS, M.Phil (Biochemistry) Professor & Allied Medical Profession, HOD Biochemistry Sahara Medical College Narowal.
3. MBBS, FCPS (Clinical Path) Professor of Pathology Wah Medical College.
4. MBBS, FCPS (Med) Assistant Professor Medicine Wah Medical College.
5. M.Phil Assistant Professor Rehabilitation Islamabad Medical and Dental College, Islamabad.

### Correspondence Address:

Dr. Naveed Arshad  
Department of Rehabilitation  
Islamabad Medical and Dental  
College, Islamabad,  
Main Murree Road, Sattran Meel,  
Bhara Kahu, Islamabad.  
oliajann@gmail.com

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**ABSTRACT... Objectives:** To assess the clinical characteristics and diagnosis of ACS for timely, management and further prevention from coronary events. **Study Design:** Cross sectional study. **Setting:** Emergency Department (ED) of Punjab Institute of Cardiology (PIC) Lahore. **Period:** November 2017 to January 2018. **Material & Methods:** Included 170 diagnosed patients of ACS of both sexes presenting within approximately four hours of symptoms. **Results:** A total of 170 patients with established diagnosis of ACS were included. The mean age of the patients was 56 years. There was a very strong male predominance (81.76%). The major modifiable risk factors were hypertension (54.71%) and smoking (35.88%), followed by hyperlipidemia (35.29%) and diabetes (32.35%). A previous history of IHD in patients and family history of IHD were equally present (37.65%). A large proportion of patients belonged to middle class (54.12%) and lower (41.18%). Typical pain chest pain was present in 90% and majority of patients enrolled in this study had a diagnosis of myocardial infarction 77.05% and the remainder had unstable angina. We found a higher percentage of ST elevation MI in the patients with MI (84.73%), majority had anterior AMI. Of all patients, 1.77% expired during hospital stay. **Conclusion:** The majority of ACS patients in our country are male with STEMI. The major risk factors are hypertension, family history of IHD, smoking, hyperlipidemia and diabetes. 90% patients present with typical chest pain while remaining 10% atypical symptoms which must be of prime consideration to assess ACS.

**Key words:** Acute Coronary Syndrome, Myocardial Infarction, Risk Factors

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## INTRODUCTION

According to recent statistics of World Health Organization, the most common cause of death in the world is coronary heart disease (CHD) accounting almost 9.5 million deaths in year 2016.<sup>1</sup> The rates of main cardiovascular events and death have been found to be significantly superior in low-income countries compared to high-income countries, in spite of the reality that these countries have the lowest risk-factor.<sup>2</sup> The patients of CHD present as ACS a results of myocardial ischemia and its components are unstable angina (UA), non-ST-segment elevation myocardial infarction (NSTEMI), and ST-segment elevation myocardial infarction (STEMI). All three categories have ischemic symptoms in common. STEMI is always with persistent ST segment elevation or a new left bundle branch

block on electrocardiography (ECG), NSTEMI is with elevated cardiac troponin levels but no ST segment elevation and Unstable angina has symptoms of cardiac ischemia without elevated ST-segment or cardiac troponin levels.<sup>3</sup> The common presenting complaint of ACS patients in emergency is chest pain, retrosternal pressure or heaviness which may radiate to left arm, jaw or neck.<sup>4</sup>

The worldwide chief risk factors investigated for coronary artery disease may be high blood pressure, tobacco smoking and alcohol consumption whereas the high blood pressure has been listed as number one.<sup>5</sup> The discrete statistics data for recent Global Burden of Diseases (GBD), have shown the hypertension as the top most risk factor worldwide in causing

ischemic heart disease and stroke, so contributing to the Burdon.<sup>6</sup> The prevalence of coronary artery disease (CAD) is globally rising especially in South-Asians who are targeted at relatively younger age compared to the inhabitants of other areas of the world.<sup>7</sup> This rising trend may be attributed to industrialization, urbanization and posing changes in daily life and is called epidemiological transition. One of the major components of this transition is age of *inactivity and obesity*, when decreasing physical activity leads to epidemics of diabetes, hypertension and dyslipidemia which are responsible for growing CVD incidence and its associated death rates.<sup>8</sup>

Acute myocardial infarction is one of the top ten diseases which lead to increased mortality in elderly due to challenges like atypical symptoms, few changes on ECG and no significant levels of biochemical markers. These challenges pose difficulty in diagnosing AMI by treating physicians in elder patients.<sup>9</sup> It has been found that STEMI type of AMI is globally the most important cause of death and morbidity.<sup>10</sup>

## MATERIAL & METHODS

This descriptive cross sectional study was carried out at the emergency department (ED) of Punjab institute of Cardiology (PIC) Lahore from November 2017 to January 2018. The study was approved by the ethical committee of the Postgraduate Graduate Medical Institute Lahore and was conducted with the approval of the head of PIC Lahore. A total of 170 patients with symptoms of ACS presenting to the ED and having final diagnosis of ACS were included in the study. The diagnosis was confirmed by the expert team of doctors working in emergency department. The inclusion criteria were patients of both sexes with age  $\geq 35$  years, presenting with chest pain and/or dyspnoea within approximately 4 hours of onset and final diagnosis of ACS. The exclusion criteria were subjects who had undergone any cardiac intervention or thrombolysis at early stage and those with serum creatinine level  $\geq 1.3$  mg/d. Informed written consent was taken from all the individuals included in the study.

At presentation history of presenting complaints,

ECG and Blood samples for Trop-T and routine investigations were also obtained from all patients. A next blood sample was drawn at 8hrs of arrival for the assessment of Troponin T to confirm NSTEMI. General physical and systemic examination along with complete history including hypertension, smoking, diabetes and previous family history of ischemic heart disease was taken from all patients. The values of cardiac biomarkers (Troponin-T, CK-MB and CPK), creatinine, lipid profile and other routine investigations were also documented in the Performa. AMI was defined by characteristic clinical symptoms along with typical ECG (for STEMI) changes or cardiac necrosis marker cTnT (for NSTEMI) whereas UA was diagnosed if only typical symptoms were present and patient recovered with ACS Protocol. Data was analyzed statistically by SPSS software, version 18 and a P-value  $\leq 0.05$  was considered significant.

## RESULTS

One hundred and seventy patients; 139 (81.76%) male and 31 (18.24%) female of ACS based on clinical features, ECG changes and cardiac troponin T level, participated in the study. The mean age of the patients was 56 years while range of age was 35-85 years. Previous history of hypertension and IHD was present in 93 (54.71%) and 64 (37.65%) patients respectively while a family history of IHD was present in 64 (37.65%) patients. Among 170 patients of ACS 61 (35.88%) were smoker who were all male while 60 (35.29%) were with hyperlipidemia and 55 (32.35%) were known diabetic. Hyperlipidemia was defined if serum cholesterol, LDL and HDL cholesterol were deranged The socioeconomic status was also documented and the majority of the patients belonged to middle class (54.12%) and lower class (41.18%) whereas a few (4.71%) belonged to upper class.

In ACS patient the main presenting complaint was typical chest pain (90%)  $\pm$  other associated symptoms followed by chest heaviness (4.12%) and dyspnoea (4.70%)  $\pm$  other associated symptoms. One patient presented with epigastric pain and sweating, while another with fainting

and vomiting. In 170 patients 131 (77.05%) had AMI and 39 (22.95%) UA. Among AMI patients, 111 (84.73%) included STEMI and 20 (15.27%) NSTEMI. The Anterior wall MI variety was the most frequent diagnosis (n= 57, 51.35%) followed by inferior wall MI variety (n=52, 46.85%) and isolated lateral wall MI (n=2, 1.8 %). The Anterior wall MI variety most frequently involved Anteroseptal MI (26.13%) while among inferior wall MI variety, the isolated inferior wall MI was most frequent (25.23%) diagnosis. All the patients were managed on ACS protocol and three patients (1.77%) expired and their diagnosis was STEMI; two during acute management due to cardiogenic shock and one due to cardiac arrest just before discharge from hospital.

<b>Anterior wall MI Variety</b>	<b>57 (51.35%)</b>
Anteroseptal MI	29(26.13%)
Extensive Anterior wall MI	08(7.21%)
Anterior wall MI	06(5.41%)
Anterolateral wall MI	05(4.50%)
Extensive anterolateral wall MI	04(3.6%)
Extensive anteroposterio wall &RV MI	01 (0.90%)
Anterior wall I &RV MI	01 (0.90%)
Anteroseptal MI & Rt. bundle branch block	01 (0.90%)
Anteroseptal MI & Lt. bundle branch block	01 (0.90%)
Antero inferior MI	01 (0.90%)
<b>Inferior wall MI Variety</b>	<b>52 (46.85%)</b>
Inferior wall.23 MI	28(25.23%)
Infero posterior wall MI	10(9%)
Inferior wall & RV MI	09(8.11%)
Inferolateral wall	02(1.8 %)
Infero postero lateral wall MI	01 (0.90%)
Infero postero lateral wall MI&RV INF	01 (0.90%)
Inferior wall MI & Lt. bundle branch block	01 (0.90%)
<b>Isolated Lateral wall MI</b>	<b>02 (1.8%)</b>
<b>Table-I. Different types of STEMI (n=111)</b>	

## DISCUSSION

CVDs have been the key basis of health loss globally and the ischemic heart disease (IHD) is the foremost cause of this worldwide phenomena occurring almost in every part of world.<sup>11</sup> IHD may affect persons at any age but becomes noticeably more common with advancing age,

roughly tripling with every decade of life. Males are common victims compared to females.<sup>12</sup> The majority of South Asian countries, including Pakistan, Sri Lanka, Bangladesh, India, and Nepal, cover more than a quarter of the low and middle-income countries and are recognized to have a top risk of coronary heart diseases (CHD) as compared to the rest of the world.<sup>13</sup> Preventive strategies of IHD are targeted on detection and treating the risk factors both at the population and at personal levels by applying primordial, primary, and secondary preventive measures.<sup>14</sup>

The CVDs may be significantly reduced by effective preventive measures focused on contributing factors. The important measures may include sufficient body exercise, losing body weight, controlling BP, healthy food, lowering cholesterol levels and quitting smoking. Medications and exercise have almost equal effects in mortality reduction.<sup>15</sup>

In present study 81.76% were male and 18.24% were female showing a male to female ratio of 4.5:1 which is similar to various studies on ACS that have shown a male predominance. Gopalakrishnan et al (2018)<sup>16</sup> recruited a total of 236 patients of ACS in their study for different characteristics and reported 77.97% and 22.03% male and female respectively, with a male to female ratio of 3:1. The mean age of patients in our study was 56yrs which shows close similarity with the other studies done on in South Asian ACS patients. Sharma et al (2014)<sup>17</sup> analyzed 1562 patients of ACS and the mean age of patients were calculated to be 54.71yrs and the male were in majority (79.5%). The frequent age of presentation of ACS was between 40-60years (65.88%) in our study.

Hypertension appeared to be the most prominent modifiable risk factor (54.71%) in our study and is consistent with the other studies. A study done in India by Mohanan et al(2013)<sup>18</sup> reported 48.8% hypertension in ACS patients while in another study done recently in China by Ge et al (2018)<sup>19</sup> have documented 57.2% patients of ACS with hypertension. Our study reported that both history of previous IHD and family history (37.65%) were

same among all patient and these findings are almost in agreement with those of Ralapanawa et al (2019)<sup>20</sup> who carried out research on 300 ACS patients and investigated that previous history of IHD in patients and family history of IHD were 41% and 33% respectively. Our study has revealed the presence of hypercholesterolemia and diabetes mellitus in ACS cases as 35.29%.and 32.35 respectively. These statistics are almost similar to work shown by Savith et al (2014)<sup>21</sup> who found hypercholesterolemia and diabetes mellitus 30% and 28% to be associated with ACS respectively. Our findings are also very much consistent with data presented by Farman et al (2011)<sup>22</sup> who calculated diabetes, smoking and hypertension, 38.9%, 24.8%, and 47.8% respectively, in 113 ACS subjects. Contrary to our findings, a recent cross sectional study done by Adam et al (2017)<sup>23</sup> on ACS patients in an urban tertiary care hospital in Pakistan has shown a maximum association of dyslipidemia (91.2%), followed by hypertension (70.4%) and diabetes (51.2%). They found a family history of ACS (40.0%) and smoking (29.2%) which almost match with our results (37.65%) and (35.88%) respectively. They also calculated that 98.4% of patients were having at least one risk factor which matches with our (95.88%) findings.

Most of our patients (90%) had the typical chest pain at presentation and (10%) atypical symptoms. Our findings are similar to those demonstrated King-Shier et al (2018)<sup>24</sup> demonstrated approximately the similar results in South Asian ACS Patients; 81% and 19% typical and atypical symptoms respectively. STEMI has become a chief public health concern and in the present study it comprised 65.30%, of ACS patients while remainder 22.95% and 11.77% with UA and NSTEMI respectively. Our results almost resemble with the results given by other studies done in Indo-Pak. Data published by study on ACS by Sharma et al (2014)<sup>17</sup> revealed 63.7% , 25% and 11.3% STEMI UA and NSTEMI respectively.

In the present study among STEMI the most frequent variety was AWTMI (51.35%), followed by IWMI variety (46.85%), and isolated LWMI (1.85%).

Our findings are quite similar to those published by Zeb et al (2017)<sup>25</sup> which included IWMI variety (52.88%), IWMI variety (44.01) and isolated LWMI (3.05%). In-hospital death record in our ACS patients was 1.77% which is in accordance with the records published by Jafary et al (2007)<sup>26</sup> who noted an in hospital mortality in 2.5% of patients of ACS. Also our percentage of in-hospital expiry of patients is less than many previous and recent studies which is most probably due to early presentation as we only took those patients who presented within 4hrs of symptoms.

## CONCLUSION

The profile of ACS patients shows that a majority of ACS patients in our country is male and the most prominent diagnosis is STEMI of which anterior wall MI variety is predominant. The major modifiable risk factors are hypertension, smoking, hyperlipidemia and diabetes 90% patients present with typical chest pain while remaining 10% atypical symptoms which must be of prime consideration to assess ACS. Education of public in medical office setting and in the community is important because timely treatment of risk factors can reduce the burden of IHD. Moreover, the minimal delay on the patient's side to seek medical help as well as careful assessment from local physicians is also recommended.

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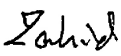

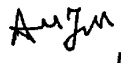
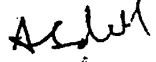
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### AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Zahid Mahmood	Conception, Design, Synthesis and planning of the research, Active participation idea data collection and management, Drafting of article.	
2	Tariq Feroze Khawaja	Participation in active methodology, Assembly of data, Statistical expertise.	
3	Anjum Iqbal	Critical revision of the article for important intellectual content.	
4	Abdul Rashid Khan	Analysis and interpretation of the data.	
5	Naveed Arshad	Participation in Statistical analysis and drafting.	