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EVALUATION OF VARRIOUS PRESENTATIONS IN AMI PATIENTS AT NICVD KARACHI, PAKISTAN

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ABSTRACT

To evaluate the rate and extent of various presentations of acute myocardial infarction as well as to highlight different causes along with clinical outcomes.

A descriptive cross-sectional study was conducted in Department of Medicine (Unit-III) of National Institute of Cardiovascular Disease, Karachi for a period of 28 weeks. A total of three hundred (300) subjects of acute myocardial infarction were enrolled via purposive sampling.

The prevalence of Shortness of breath (SOB) was the most frequent presentation in AMI, presented in atypical and typical that is 76% and 11.33% ($\leq$ 0.01), while sweating was 56% and 6% ($\leq$0.01) respectively. Moreover, high blood pressure/hypertension was the most common risk factor (66.33%) followed by the cigarette smoking (43.66%), Diabetes mellitus (DM) (34.66%) and lipid levels abnormality (30.33%), while the body mass index (BMI) 26.55$\pm$2.9 in male and 28.65 $\pm$ 3.5 in female. However, the occurrence of cardiac shock (CS) was 33%, cases of

ventricular tachycardia were 21.33%. Mechanical complication was 1% plus mortality was 13% respectively. The difference in rates of CS (p =0.06 & 0.04) and difference for death in typical presentation is also statistically significant (p = 0.03), the association of cold clammy skin with outcome of AMI. Furthermore the rate of CS and death are 67.85% and 28.4% in atypical group (p=0.001) and (p=0.006). Subsequently, an increased death rate was also noticed in cases of ventricular arrhythmias in atypical group as compare to typical [<0.05p].

From the above discussed facts it can be aptly concluded that prevalence of various types of cardiovascular problems including myocardial infarction may proceed towards the life threatening outcomes. However, it is mandatory to abruptly aid such cases with a conscious attitude to dramatically reduce the prevalence of such hazardous conditions.

Keywords: Acute myocardial infarction: Atypical presentation; Cardiogenic shock and Karachi Pakistan

INTRODUCTION

Acute myocardial infarction is one of the most severe issue to be highlighted and a critical health issue for which it is necessary to look ahead at priority basis. Subsequently its critical nature still exists despite of proper diagnosis and urgent aid for the last thirty years. However, the mortality rate is decreased to 30 percent but even though AMI produces devastating events in one third of patients **[1]**. Furthermore, AMI can appear with various signs and presentations, as explained by Henrick that sometimes AMI is without complain of Chest pain **[1-3]**. Similarly, the chest pain might not appear in patients with diabetes mellitus as well as patients suffer from autonomic dysfunction. At contrary, a time being diagnosis may help in correct therapy specially patients with myocardial infarction **[1-3]**. Similarly some of the symptoms like shortness of breath, cough without mucous, lethargy, nausea, vomiting, palpitation etc, might put the doctor in a dilemma **[4-6]**. Subsequently, it is very necessary to identify the actual signs and symptoms to provide a rational medical aid to the patient. The problem could be resolved if the patient once believe that angina is one of the main sign of acute myocardial infarction **[7-9]**.

Atypical types of symptoms are only present in those patients with acute coronary syndromes (ACS) except pain in chest is most common wrongly diagnosed on initial checkup that leads to wrong prognosis of the disease and resulting poor clinical outcomes are seen **[10, 11]**. At the other hand, another

study had shown that angina is not a cardinal complaint but the extra cardiovascular i.e. gastric pain and certain respiratory symptoms accompanying with angina of less intensity. In hospital presentation, the most important aspect was the absence of pain in chest expected less usage of thrombolytic therapy **[11, 12]** and also attached with complications in hospital setup that leads to high chances of death as compared to a typical presentation **[10, 11, 14]**. Symptoms, which are a key element in the patients' decision for appropriate care, are critical to appropriate triage, and influence the decision on whether to pursue further evaluation and starting of treatment **[13]**. Initial studies had showed that among patients with less than 70 years age, angina is predictive. However, angina might not appear in patients older than 70 years **[13]**. This cause might delay the medical aid and ultimately lead to a critical outcome. Moreover, many studies had highlighted the causes of atypical angina i.e. age, gender and diabetes **[14, 15] [16, 17]**. Angina pectoris found to be the cardinal sign among MI patients **[18]**. W.H.O explained the chest pain as a main feature of myocardial infraction diagnosis **[19]**. A study that was sponsored by health institute to check the effect of counseling on those persons who have MI symptoms and their initial treatment **[20]**, with this it was also concluded by one study that there was not necessary about the pain in chest as a classical symptoms **[21]**. Another study confirmed the previous results that mostly the ratio of death was high without chest pain MI patients **[22, 23]**.

METHODOLOGY

A descriptive cross-sectional study conducted in Department of Medicine (Unit-III) at National Institute of Cardiovascular Disease (NICVD), Karachi for a time span of 28 weeks after approval of synopsis. However a total of three hundred (300) patients of acute myocardial infarction were enrolled via purposive sampling. Patients suffer from MI were included as a part of study. Where as, the cases of post-CABG & COPD were excluded from the study. The patients brought to the emergency room (E.R) under cardiovascular problems were analyzed. The patients were monitored for AMI (acute myocardial infarction) by adapting American Heart Association guidelines (24) within 12 hours of onset of symptoms. However, a statistical tool i.e. the statistical package for social science (SPSS-20) was used to analyze and interpret the data.

RESULTS

A total of three hundred (300) AMI patients were selected for the purpose of current study. The average age of patients was found to be

56.59±12.73 ranging from 28 to 82 years. The mean systolic and diastolic blood pressure was 119.10 ± 18.24 and 72.62 ± 11.30 respectively. While the baseline pulse rate and respiratory rate was 81.34 ±17.95 & 23.15± 4.75 **(Table 1-2)**

Out of the total number of patients, two hundred eighteen (218) were male and eighty two (82) were female **(Figure-1-2)**. These patients were categorized further according to the appeared symptoms i.e. typical and atypical respectively. However, in atypical group, 61 were female and male were 89. Contrarily, in typical group 21 were female and 129 were male respectively. **(Figure 3)**.

The atypical symptoms included shortness of breath (dyspnea), sweats, nausea, vomiting, palpitations, cold clammy skin and distorted mental status respectively. Dyspnea was found to be the most widely happening i.e. 76% in atypical and 11% in typical group (≤ 0.01) whereas, sweating was observed 56% in atypical group, while 6% in typical group (≤0.01) **(Table 3)**.

Out of total of three hundred (300) patients, hypertension was found to be the most widely occurring factor (57.33% in typical & 75.33% in atypical cases) along with smoking (55.33% in typical and 32% in Atypical presentation), Diabetes mellitus (20% in typical and 49.33% in atypical presentation %) and increased lipid levels (Dyslipidemia) (36.66% in typical and 24% in atypical presentation 30.5%), while the BMI 26.55±2.9 in male and 28.65 ± 3.5in female **(Table 4)**.

In outcome of AMI, cardiogenic shock was the 99 (33%), ventricular tachycardia was the 64 (21.33%), complete heart block 38 (12.66%), Mechanical complication was 3(1%) and mortality was 39 (13%) observed. **(Table 5; Figure 4)**

We found the association of typical and atypical symptoms with outcome of AMI by the cross tabulation (chi-square) in **Tables (1-7)**.The association of SOB for atypical and typical with outcomes of AMI, the risk of cardiogenic shock was also observed respectively. The different in rates of CS for these groups are statistically significant (p =0.06 & 0.04).The differences in rates of death in presenting of SOB for typical is also statistically significant (p = 0.03), other outcome of AMI are not statistically significant in typical and atypical for SOB presentation **(Table 6)**.

The association of cold clammy skin with outcome of AMI, the rate of CS and death are 68.4% and 36.8% in atypical group. The difference in rates of CS and death for atypical group are statistically significant (p=0.001) and (p=0.006), other outcome of

AMI are not statistically significant in atypical and typical group for cold clammy skin presentation **(Table 7)**.

Table 1: Base Line Characteristic Study (n= 300)

Variables	Mean ± SD	Minimum Value	Maximum Value
Age (years)	56.59±12.73	28	82
Pulse	81.34±17.95	38	127
Systolic BP	119.10±18.24	60	200
Diastolic BP	72.62±11.30	40	110
Respiratory Rate	23.15±4.75	18	40

BP = Blood Pressure

Table 2: Base Line Characteristic Study According To Gender and Typical and Atypical (n= 300)

Variables	Typical n=150		Atypical n=150		TOTAL n=300	
	Male n=129	Female n=21	Male n=89	Female n=61	Male n= 218	Female n=82
Age (years)	52±11.9	52.2±11.4	60.5±11.4	57.1±11.5	54.1±11.6	58.8±11.9
Pulse	83.7±22.1	83.1±15.4	88.7±15.3	83.2±17.1	83.1±16	87.7±16.8
Systolic BP	110.9±26.3	121.7±22.5	103.2±24	110.6±22.8	117.3±23.3	104.7±24.4
Diastolic BP	73.6±16.3	76.8±12.6	67±11.5	71.1±10.8	74.6±12.2	68.4±12.7
RR	25.1±4.7	24.3±4.3	23.6±3.9	22.9±3.5	23.7±4.1	23.9±4.1

Data are presented in Mean ± Standard Deviation; BP = Blood Pressure, RR = Respiratory Rate

Table 3: Frequency of Typical and Atypical Presentation IN ACUTE MYOCARDIAL INFARCTION

Presentation In Acute Myocardial Infarction	Typical N=150		Atypical n=150		P-Values
	Count	%	Count	%	
Shortness of breath	17	11.33%	114	76%	≤ 0.01
Sweating	9	6%	84	56%	≤ 0.01
Nausea	14	9.33%	51	34%	≤ 0.01
Vomiting	12	8%	42	28%	≤ 0.01
Syncope	0	0%	3	2%	NS
Palpitation	9	6%	53	35.33%	≤ 0.01
Cold clammy skin	3	2%	29	19.33%	≤ 0.01
Epigastric pain	0	0%	53	35.33%	≤ 0.01
Altered mental status	0	0%	15	10%	≤ 0.01
Dizziness	0	0%	2	1.33%	NA
Heaviness	0	0%	3	2%	NA
Choking	0	0%	2	1.33%	NA

***Chi Square Test was applied to get P-values. Significant differences (p≤ 0.01) were observed except syncope; NS = Not Significant; NA = Not Applicable**

Table 4: risk factor of acute myocardial infarction With respect to typical and atypical

Risk Factor	Typical n=150		Atypical n=150	
	Count	%	Count	%
Hypertension	86	57.33%	113	75.33%
Diabetes mellitus	30	20%	74	49.33%
Smoking	83	55.33%	48	32%
Dyslipidemia	55	36.66%	36	24%

Table 5: Outcome of Myocardial Infraction According To Gender And Typical and Atypical Groups (N= 300)

Variables	Typical N=150		Atypical n=150		TOTAL n=300	
	Male n=129	Female n=21	Male n=89	Female n=61	Male n= 218	Female n=82
Cardiogenic Shock	39	6	21	33	60	39
Mechanical Complication	0	0	3	0	3	0
Ventricular Tachycardia	15	10	34	5	49	15
Complete Heart Block	15	3	15	5	30	8
Death	8	5	12	14	20	19

Data Are Presented In Count

Table 6: association between shortness of breath presentation For typical and atypical with outcome of myocardial infraction

OUTCOME OF MYOCARDIAL INFRACTION		Atypical (n=150)			Typical (n=150)		
		Shortness of breath			Shortness of breath		
		Yes (n=9)	No (n=141)	P-Value	Yes (n=84)	No (n=66)	P-Value
Cardiogenic Shock	Yes	6(66.7%)	39(27.7%)	0.06*	38(45.2%)	17(25.8%)	0.04*
	No	3(33.3%)	102(72.3%)		46(54.76%)	49(74.2%)	
Mechanical Complicatio n	Yes	0	0	NA	0	3(4.5%)	0.19
	No	9(100%)	141(100%)		84(100%)	63(95.5%)	
Ventricular Tachycardia	Yes	5(55.55%)	35(24.82%)	0.16	18(21.4%)	8(12.12%)	0.18
	No	4(44.44%)	106(75.17%)		66(78.6%)	58(87.87%)	
Complete Heart Block	Yes	2(22.22%)	17(12.05%)	0.72	8(9.52%)	12(18.2%)	0.17
	No	7(77.78%)	124(87.94%)		76(90.47%)	54(81.8%)	
Death	Yes	2(22.22%)	17(12.05%)	0.42	20(23.80%)	5(7.57%)	0.03*
	No	7(77.78%)	124(87.94%)		64(76.19%)	61(92.42%)	

NOTE: Percentage were computed within Shortness of breath; Significant; NA = Not Applicable

Table 7: Association Between Cold Clammy Skin Presentation For Typical And Atypical With Outcome of Myocardial Infraction

OUTCOME OF MYOCARDIAL INFRACTION		Typical (n=150)			Atypical (n=150)		
		COLD CLAMMY SKIN			COLD CLAMMY SKIN		
		Yes (n=3)	No (n=147)	P-Value	Yes (n=28)	No (n=122)	P-Value
Cardiogenic Shock	Yes	1(33.33%)	44(29.93%)	0.53	19(67.85%)	35(28.4%)	.001*
	No	2(66.67%)	103(70.06%)		9(32.14%)	87(71.31%)	
Mechanical Complication	Yes	0(0%)	0(0%)	NA	2(7.14%)	2(1.63%)	0.26
	No	3(100%)	147(100%)		26(92.85%)	120(98.36%)	
Ventricular Tachycardia	Yes	0(0%)	39(26.5%)	0.39	5(17.85%)	21(17.21%)	0.87
	No	3(100%)	108(73.46%)		23(82.14%)	101(82.78%)	
Death	Yes	0(0%)	12(8.2%)	0.67	10(35.71%)	20(16.39%)	.006*
	No	3(100%)	135(91.8%)		18(64.28%)	102(83.60%)	

Note: Percentage were computed within cold clammy skin; * Significant; NA = Not Applicable

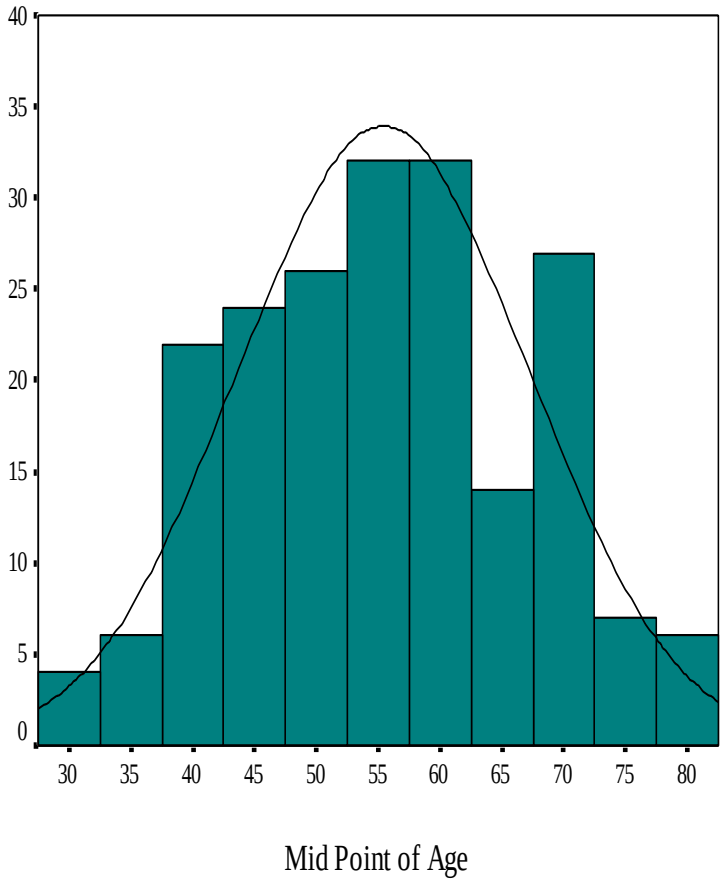

Figure 1: Histogram of Age With Normal Curve (n=300)

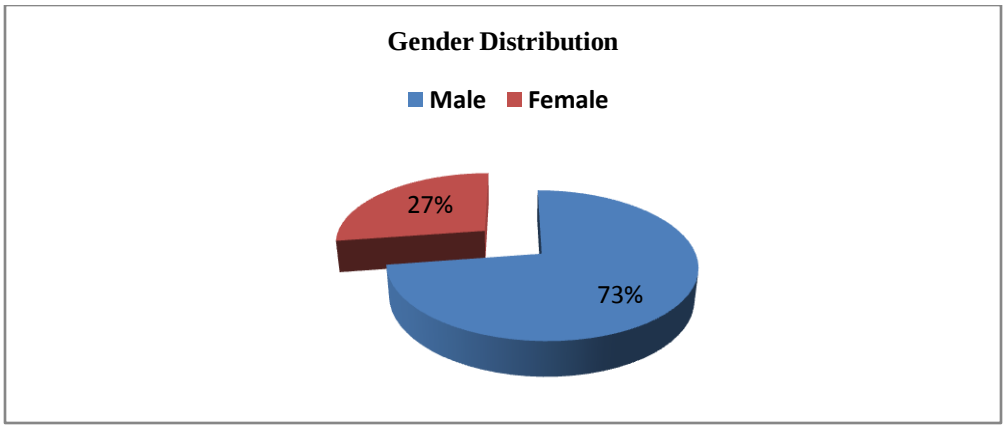

Figure 2: Gender Distribution (n= 300)

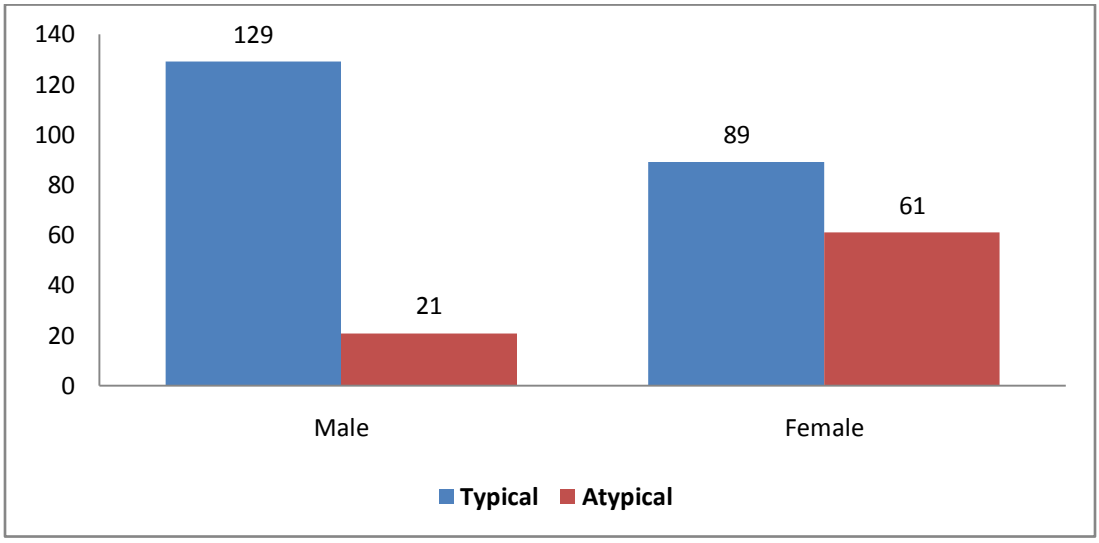

Figure 3: Gender Distribution According to Typical and Atypical (N= 300)

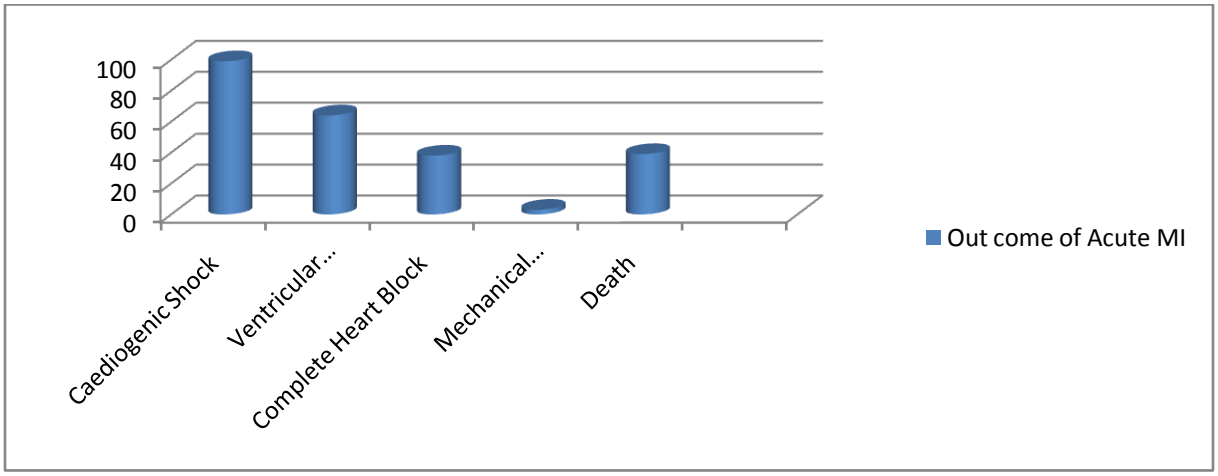

Figure 4: Outcome of Myocardial Infraction (n=300)

DISCUSSION

Being the most common and most dramatic manifestation of acute myocardial infarction, chest pain is one of the most important parameter for the diagnosis of this disorder. In this study seventy three percent were males and twenty seven percent were female with a ratio of 2:4:1, which is almost same as of a precedent study conducted in Pakistan **[25]**, with 3:1. Assessing our findings regarding death ration in AMI patients with atypical and typical presentation group is 17 % & 9 % respectively, which is about double in atypical group. In previous studies **[26, 27]** revealed almost same mortality ratio in these groups and showed significantly higher early and late mortality in atypical group of patients than that of their counterparts presenting with chest pain. In Barry F and colleagues **[28]** study quote an almost same findings between these two groups were almost 3-fold higher mortality noticed in the atypical group, which is also helpful for our study findings. From analysis ,this high ration of death may be attributed due to cardiogenic shock (CS) is more present in higher percentage in atypical group as compare to typical. Medias JE and colleagues **[29]** found that painless presentation of myocardial infarction related with positively with age and admission Killip class and negatively with history of prior angina, also it was not predictor of increased rate of mortality or life threatening abnormal rhythm of the heart. A study conducted by Uretsky et al **[28]** and concluded that out of total patients 25% patients admitted were those having confirmed infarcts symptoms other than pain in chest, they also revealed that no any angina was noted in these patients but CS was noted .In this study of symptomatology and outcome of AMI the leading and common complain for atypical presentation was shortness of breath. The effect of age, and sex on the occurrence of typical of atypical presentation in AMI patients has a logic and generally accepted idea that older patients with AMI are less likely to present with typical chest pain **[30]**. In Goldstan and colleagues' study **[31]** which acknowledged the same results as in our study the shortness of breath was the leading symptoms.

Ventricular arrhythmias was the 2nd leading outcome of AMI patients and associated with higher mortality was noticed with atypical group as compare to typical (<0.05p0 in our study. Schulze *et al*., **[32]** reported findings from the 1st post infarction studies of left ventricular dysfunction, ventricular arrhythmias and death in which all eight (8) deaths in their 81 patients occurred in the group due to high grade ventricular

arrhythmias and LVEF below 40%. Later Ruberman et al **[33]** and Moss *et al*., **[34]** concluded their findings about the left ventricular dysfunction and ventricular arrhythmias were independent risk factors for death after myocardial infarction.

CONCLUSION

From the above discussed facts it can be aptly concluded that prevalence of various types of cardiovascular problems including myocardial infarction may proceed towards the life threatening outcomes. Moreover, AMI could appear with or without chest pain. However, it is mandatory to abruptly aid such cases with a conscious attitude including a proper education of healthcare team and patients too, in order to dramatically reduce the prevalence of such hazardous conditions.

COMPETING INTERESTS

The authors declare that they have no competing interests.

AUTHORS' CONTRIBUTIONS

All authors read and approved the final manuscript.

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