DOI: https://doi.org/10.53350/pjmhs2216589

ORIGINAL ARTICLE

Frequency of Complete Heart Block in Patients with Acute Inferior Wall Myocardial Infarction

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ABSTRACT

Background: Acute MI is the leading health issue globally affecting many lives.
Aim: To determine the frequency of complete heart block in patients with acute inferior wall myocardial infarction.
Study Design: Cross-sectional study.
Methodology: All newly diagnosed inferior wall MI patients were included. Detailed history followed by detailed clinical examination was done. ECGs were done. Complete heart block was evaluated. It was considered as third degree AV block and was diagnosed when there was no AV nodal conduction and the P wave was completely dissociated from the QRS complexes. All this information was recorded on Performa. Data was analyzed using SPSS version 25. Cardiogenic shock was stratified among age and gender by applying chi square test.
Results: Age as mean ± SD was 62 ± 8.04 years. Enrolled males were 59% while females were 41% in present study. Results showed that 19% patients had complete heart block while 81% were without it.
Conclusion: It was concluded that frequency of complete heart block was high (19%) in patients with inferior wall MI
Keywords: Complete Heart Block, Myocardial Infarction and Frequency.

INTRODUCTION

Acute MI is the leading health issue globally affecting many lives[1]. According to literature review, almost 450, 000 deaths[2] occurred in US because of it while it affects more than one million people per year[3].

Myocardial infarction (MI) is a clinical event that causes myocardial injury followed by necrosis due to its ischemia[4,5]. Inferior wall myocardial infarction is characterized by ST segment shifts or any change in leads (II, III and aVF). In more than one third of cases inferior wall MI is associated with right ventricular infarction.

One study reported that patients of inferior wall STEMI with and without complete heart block were 96.7% and 75.4% respectively. Infarct related artery (IRA) was Dominant Right Coronary Artery (RCA) in 95% of the patients with complete heart block (mostly proximal occlusion), Dominant Left Circumflex in 1% and multi-vessel disease in 56% of the patients[6]. In another study, when RCA was occluded at its origin, CHB was observed in 18 to 24% of patients where as with lesion at its bifurcation, it was 13 to 15%[7]. Early reperfusion in these patients is associated with early resolution of CHB and primary PCI in these patients shows complete resolution of CHB in less than 6 hours. The use of reperfusion therapy is associated with significant decline in in-hospital mortality (42% Vs 12.8%; P=0.0032) compared with conservative treatment in patients with complete AV block[8]. Patients with inferior wall MI and persistent CHB irresponsive to pharmacologic therapy have been treated successfully with PCI after 18 hours and showed resolution of CHB at different time frames. AV nodal cells are different from other myocardial cells in that they are less dependent on oxidative phosphorylation; hence there is possibility of recovery of conducting tissue even with late revascularization[9].

In one study the incidence of complete atrio ventricular (AV) blocks was 5% of myocardial infarction (MI) patients[10]. In another study out of 70 patients studied, 13 patients (18.6%) developed CHB. Severe coronary artery disease in infarct related artery (RCA) was observed in 12 patients (92.3%) and 32 patients (56%) in patients with and without CHB respectively (p=0.015)[11]. MI is very common in our population and a variety of complications are observed in patients with MI including heart blocks, arrythmias and shocks so due to lack of local data, we planned current study.

Received on 19-10-2021
Accepted on 29-04-2022

The objective of the study was to determine the frequency of complete heart block in patients with acute inferior wall myocardial infarction**.**

METHODOLOGY

Present study was conducted Cardiology Unit, Hayatabad Medical Complex, Peshawar after permission from Ethical Review Board. Newly diagnosed patients (n=233) who had inferior wall MI were included. Detailed history followed by detailed clinical examination was done. ECGs were done. Diagnosis of acute inferior wall MI was made. Complete heart block was evaluated. It was considered as third degree AV block and was diagnosed when there was no AV nodal conduction and the P wave was completely dissociated from the QRS complexes. Patients with previous angioplasty AV blocks, hyper-kalemia or hypokalemia (K<3.5mmol/l) were excluded. SPSS v25 analyzed the data. Mean ± SD was used for age and BMI. Frequency and percentages was used for other categorical variables (smoking, hypertension, diabetes and complete heart block). CHB was stratified among age and gender. Post stratification Chi square test was applied with P-value < 0.05 as significant.

RESULTS

Total 233 patients were enrolled. The patients mean age was 62±8.04 year. Other parameters like complete heart block, BMI, gender, HTN, Smoking status were presented as frequency and percentage in Table-1.

Table-1: Parameter of all subjects (n=233)

Variables	Groups	Frequency	%age
Gender	Males	137	59
	Females	96	41
Complete heart block	Yes	44	19
	No	189	81
Smokers	Yes	77	33
	No	156	67
Hypertension	Yes	165	71
	No	68	29
BMI (Kg/m^2)	< 25	89	38
	> 25	144	62
	Mea± SD	26±3.11	
Age (years)	30- 40	19	8
	41-60	91	39
	61-80	123	53
	Mean±SD	62±8.04	

Stratification of complete heart block with respect to age was given in Table-2. Insignificant p-value was noticed.

Table-2: Stratification of complete heart block according to age (n=233)

Complete Heart Block	30- 40 years	41-60 years	61-80 years	p-value
Yes	4	17	23	0.9687
No	15	74	100	
Total	**19**	**91**	**123**	

Stratification of complete heart block with respect to gender was given in Table-3. Insignificant p-value was noticed.

Table-3: Stratification Of complete heart block According To Gender (n=233)

Complete Heart Block	Male	Female	p-value
Yes	26	18	0.9650
No	111	78	
Total	**137**	**96**	

DISCUSSION

Our study shows that among 233 patients mean age was 62 years with standard deviation ± 8.04. Fifty nine percent patients were male while 41% patients were female. Mean BMI was 26 Kg/m^2 with SD±3.112. Thirty three percent patients were smokers. Seventy one percent patients were hypertension. Sixty four percent patients were diabetic More over 19% patients had complete heart block and 81% patients didn't had complete heart block. Similar findings were observed in another study which reported that the incidence of complete atrio-ventricular (AV) blocks was 5% of myocardial infarction (MI) patients[12].

Another study reported that patients in their study had mean age of 50.55 ± 6.72 years at the time of MI. Majority of the patients were males (82.1%) while 17.9% were females. Their results showed that frequency of complete AV block in acute ST segment elevation MI was 7.3%. There was no association with any other clinical factor that could define this condition according to results of our study.[13] Hence, need of an hour is to built protocols in our routine clinical setups in-order to deal with life threatening conditions. Another study reported that the rate complete AV block after STEMI varies from 2.9 to 12.8%. In Pakistan the rate of complete AV block after STEMI have been reported to be 2.9–11.8%, this rate is less as compared to the other studies in the rate is reported to be 9.1–12.8%[14].

According to one previous study 28% of their patients (54/193) had AVB with inferior wall MI.[15] However, 07 of their patients died during their hospital stay thus depicting high mortality rate among patients with AVB having p-value of 0.009. Literature review regarding the incidence of AVB among western countries showed that AVB with MI has a prevalence of about 12%.This prevalence rate is quite high.[16] In comparison to our setups due to inactive life style and oily foods, incidence of ACS with complete heart block is from 21-30%. Thus increasing the mortality and decreasing the quality of life in our region as documented by previous studies.[17,18] Thus, time has reached when we have to raise our hands against crippled life due to inactive life. Health policies should be revised and implementation of exercise should be done.

CONCLUSION

It was concluded that the frequency of complete heart block was high (19%) in patients with inferior wall myocardial infarction.

Authors' Contribution: ZUA: Conceptualized the study, analyzed the data, and formulated the initial draft, **IK&WK:** Contributed to the proof reading, **MAK:** Collected data.
Limitations: Our study had limitations like financial constraints, lack of resources, genetic workup and short duration of study.
Conflict of Interest: None to declare
Financial Disclosure: None

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