Original Article

A study of Clinico- Demographic Profile of ST elevation MI patients

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Abstract

Introduction: Acute myocardial infarction causes more deaths and disability and incurs greater economic costs than any other illness in the developed world. It is the most common, serious, life threatening illness in the world. **Aims and Objectives:** To study Clinico- Demographic Profile of ST elevation MI patients. **Methodology:** 50 cases of acute myocardial infarction admitted in Aarupadaiveedu Medical College. All the patients above 25 yrs. Patients presented with typical anginal pain persisting for >30 min. Investigations like urine examination, complete blood picture, erythrocyte sedimentation rate, blood urea, serum creatinine, blood sugar electrolytes and chest radiographic examination have been carried out. Special investigations like electrocardiogram, the echocardiogram were studied. **Result:** MI was seen more in the age group of 50yrs-59yrs (34%), 74% males and 26% females showing the male predominance, 50 patients 20 patients had anterior wall myocardial infarction (40%), 10 patients had inferior wall MI(20%),7 patients had inferior wall with RVMI(14%), 9 patients had anteroseptal(18%), 4 patients had anteroinferior(8%). Patients with Anterior wall myocardial infarction, on 2D ECHO shown anterior wall RWMA, Antero –septal RWMA, Anterior and apical RWMA, Antero lateral RWMA like findings. Patients with inferior wall myocardial infarction and Inferior wall with RVMI, ECHO findings, Inferior wall RWMA Inferior and right ventricle RWMA, Inferior and right ventricle RWMA like findings. Patient's anterior-inferior Myocardial infarction on ECHO changes Global hypokinesia Anterior, inferior wall hypokinesia like findings. **Conclusion:** Common age group affected was 50 – 60 years in males and 70-80 years in female's Anterior wall myocardial infarction was more common compared to inferior wall myocardial infarction Echocardiogram is more diagnostic than electrocardiogram as it shows more details of regional wall motion abnormalities.

Key Words: ST elevation MI patients, Electrocardiography in MI, 2 D-Echocardiogrphy in MI**,** Myocardial Infarction (MI).

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Received Date: 10/12/2015 Revised Date: 02/01/2016 Accepted Date: 04/02/2016

Access this article online	
Quick Response Code:	Website: www.medpulse.in
	DOI: 08 March 2016

INTRODUCTION

Acute myocardial infarction causes more deaths and disability and incurs greater economic costs than any other illness in the developed world. It is the most common, serious, life threatening illness in the world. Progress in the understanding of pathogenesis of acute M.I. based on the clinical features, ECG recording, enzyme markers and its treatment optimizes scientific evidence based medicine at its best. Although M.I has long been a clinically recognized entity resulting from coronary artery atherosclerosis, its appearance in modern days is increasing due to high fat diet, decreasing exercise and increased stress in life, it was described by Sir William Osler in his text book in 1892. Modern era can said to have begun autopsy studies of Herrick, who concluded in 1912 that the clinical syndrome of acute M.I result from acute thrombotic occlusion of coronary artery. It was accepted for 60 years. This was challenged in 1972 when it was suggested that coronary thrombus result rather than cause of acute infarction. Clinical

How to site this article: Gadiraju Satyanarayana Raju, Neelakandan Ramya. A study of Clinico- Demographic Profile of ST elevation MI patients. *MedPulse – International Medical Journal.* February 2016; 3(2): 159-163. http://www.medpulse.in (accessed 10 February 2016).

symptomatology is not sufficient for diagnoses unless supported by investigations. The main tool investigation being electrocardiogram has been standard in the diagnosis of acute Myocardial Infection. ECG was first recorded by Waller in 1887 in which further improvements made by Einthoven who was the Noble prize awardee in 1924.Significant differences in the prevalence of coronary artery disease exist with respect to gender, age and ethnicity. Cardiovascular diseases have emerged as a major health burden in developing countries.[1]Cardiovascular risk factors for ischaemic heart disease and acute myocardial infarction are on the rise in Pakistan. People of Indo-Asian origin have a high burden of coronary artery disease and the latter is now the leading cause of death in the Indo-Pakistan subcontinent.[2,3] The relative importance of coronary heart disease varies across regions and from country to country.[4] The disease is very common in westernized populations, affecting the majority of adults over the age of 60 years, but it is on rise in developing countries as well Gender differences in coronary heart disease risk are also important.8 Middle-aged men have a 2 to 5 times higher risk than women, but this risk ratio differs between populations.[9] It is predominantly a disease of men.[5,6] The male preponderance and smoking being the major risk factors has been well documented in many local studies.[7,8] Patients with ST elevation or new left bundle branch block are usually referred for immediate reperfusion therapy, whereas those without ST deviation or those with predominately ST depression are usually treated conservatively initially.[9,10] Patients are diagnosed as having anterior, inferior-posterior, or lateral myocardial infarction based on the patterns of ST deviation and assessment of risk is usually based on simple crude measurements of the absolute magnitude of ST segment deviation or the width of the QRS complexes.[11]An anterior wall myocardial infarction (AWMI or anterior STEMI) occurs when anterior myocardial tissue usually supplied by the left anterior descending coronary artery (LAD) suffers injury due to lack of blood supply. When an AWMI extends to the septal and lateral regions as well, the culprit lesion is usually more proximal in the LAD or even in the left main coronary artery. This large anterior myocardial infarction is termed an "extensive anterior". The ECG findings of an acute anterior wall myocardial infarction include: ST segment elevation in the anterior leads (V3 and V4) at the J point and sometimes in septal or lateral leads depending on the extent of the myocardial infarction. This ST elevation is concave downward and frequently overwhelms the T wave. This is called "tombstoning" due to the similarity to the shape of a tombstone. Reciprocal ST segment depression in the inferior leads (II, III and aVF)[12,13]

METHODOLOGY

50 cases of acute myocardial infarction admitted in Aarupadaiveedu Medical College. All the patients above 25 yrs. Patients presented with typical anginal pain persisting for >30 min. ECG features suggestive of acute MI were included into study while Patients below 25 yrs, Chest pain of duration<30min, Atypical chest Pain, Old case of MI, Diagnosed case of LBBB, Musculoskeletal pain associated with definite history of infection, abscess and trauma, Acute pericarditis/myocarditis were excluded from study. All cases were examined in detail as per proforma with special reference to cardiovascular system. Other systems were also examined in detail. In each case, history of present and pastillness werecarefully taken. Investigations like urine examination, complete blood picture, erythrocyte sedimentation rate, blood urea, serum creatinine, blood sugar electrolytes and chest radiographic examination have been carried out. Special investigations like electrocardiogram, the echocardiogram was studied to assess the regional wall motion abnormalities, ventricular aneurysm, acute mitral regurgitation and any thrombus formation.

RESULT

Table 1: Age distribution

Age group in years	No of patients	Percentage
30- 39	1	2%
40-49	7	14%
50-59	17	34%
60- 69	14	28%
70-79	7	14%
80-89	4	8%

The present study consists of 50 cases and their ages ranging from 30yrs -90yrs. MI was seen more in the age group of 50yrs-59yrs (34%)

Table 2: Gender distribution

Sex	No. of patients	Percentage
Male	37	74%
Female	13	26%

In this present study there were 74% males and 26% females showing the male predominance.

Table 3: Site of infarctionon ECG

Site of infarction	Total no of cases	Percent (%)
Anterior wall MI	20	40%
Antero septal MI	9	18%
Antero inferior	4	8%
Inferior wall MI	10	20%
Inferior + RVMI	7	14%
Total	**50**	**100%**

It is seen that out of 50 patients 20 patients had anterior wall myocardial infarction (40%), 10 patients had inferior wall MI(20%), 7 patients had inferior wall with RVMI(14%),9 patients had anteroseptal(18%),4patients had anteroinferior(8%).

Table 4: ECG of 29patients with Anterior wall myocardial infarction, on 2D ECHO shows following findings in these patients

Site of infarction on ECG	No of cases	Site of infarction on Echo	No. of cases	Percent (%)
ST ↑ V2-5 ant wall MI	11	anterior wall RWMA	11	37.93%
ST ↑V1-V4, Anteroseptal MI	9	Antero –septal RWMA	9	31.03%
ST ↑V2-V5 Anterior wall mi	5	Anterior and apical RWMA	5	17.25%
ST ↑ L1, aVL, V1-V6 ANTERO LATERAL MI	4	Antero lateral RWMA	4	13.79%
Total	**29**		**29**	**100%**

As shown in Table 4: 11patients showed anterior wall myocardial infarction on ECG. Echocardiography in these showed anterior RWMA, ECG findings of these patients are well correlated with 2deco findings. 9 patients of ECG showed anteroseptal infarction, 2d echo in these patients showed anteroseptal RWMA. ECG findings in these patient well correlated with 2d echo findings. 5 patients ECG showed anterior wall infarction, 2decho in these patients showed apical RWMA in addition to the anterior RWMA. ECG findings in these patients are well correlated with 2decho findings .2decho elaborated regional wall motion abnormalities in detail. 4 patients ECG showed antero lateral wall infarction, 2d echo in these patients showed anterolateral RWMA .ECG findings are also well correlated with 2decho in these patients

Table 5: Siteo finfarction on ECG of 17 patients within feriorwall myocardial infarction and Inferior wall with RVMI, ECHO findings are as follows in these patients

Site of infarction on ECG	No of cases	Site of infarction on ECHO	No. of cases	Percent (%)
ST ↑ L2,L3,avF- IWMI	8	Inferior wall RWMA	8	47.05
ST ↑ L2,L3,avF- IWMI ST ↑ L2,L3,avF	2	Inferior and right ventricle RWMA	2	11.76
ST ↑ RIGHT SIDEDV3-V4 INF/RVMI	7	Inferior and right ventricle RWMA	7	41.19
Total	**17**		**17**	**100%**

As shown in Table 5, ECG of 10 patients showed inferior wall MI, When Echo was done in these patients, 8 patients (47.05%) showed inferior wall myocardial RWMA, 2 patients (11.76%) had inferior wall and right ventricle RWMA, 2D ECHO was well correlated and elaborated regional wall motion abnormality than ECG .

ECG of 7 patients showed inferior and right ventricle wall , 2D ECHO in these patients were well correlated .

Table 6: Site of infarction on ECG of 4 patients anterior-inferior Myocardial infarction, ECHO changes are as follows in these patients

Site of infarction on ECG	No of cases	Site of infarction on Echo	No .of cases	Percent (%)
ST ↑ L2,L3,AvF,V2-V5 –antero inferior	3	Global hypokinesia	3	75%
ST ↑ L2,L3,AvF,V2-V5 –antero inferior	1	Anterior, inferior wall hypokinesia	1	25%
Total	4		4	100%

Site of infarction on ECG of 4 patients anterior-inferior myocardial infarction, ECHO changes are as follows in these patients. As shown in Table 5, 4 patients showed antero inferior myocardial infarction on ECG. When Echo was done in these patients 3 patients had global hypokinesia and 1 patient had anterior, inferior wall hypokinesia respectively, ECG findings are well correlated with 2d echo findings. 2decho was also elaborated regional wall motion abnormalities in detail.

DISCUSSION

Electrocardiography has been the main tool for the diagnosis of myocardial infarction since its Invention. Moreover, ECG helps to localize the site of infarction. The changes of infarction are seen in lead II, III and AVF in inferior wall infarction, in lead I, AVL and V5-6 in anterolateral infarction, in lead V1-3 anteroseptal infarction, lead V5-6 apical infarction and lead V1-6 in extensive anterior infarction. For the last few years, echocardiography has come into use for the assessment of cardiac function. It has been used to localize the site of infarction and for calculating the left ventricular ejection fraction in this study. According to Hegar *et al*. Echocardiography could evaluate regional asynergy associated with acute myocardial infarction. The location of segmental asynergy corresponded to ECG location of Q waves and pathological location of infarction. In our data, as shown in results in table No 3 :11patients showed anterior wall myocardial infarction on ECG. Echocardiography in these showed anterior RWMA, ECG findings of these patients are well correlated with 2deco findings. 9 patients of ECG showed anteroseptal infarction, 2d echo in these patients showed anteroseptal RWMA.ECG findings in these patient well correlated with 2d echo findings. 5 patients ECG showed anterior wall infarction ,2decho in these patients showed apical RWMA in addition to the anterior RWMA. ECG findings in these patients are well correlated with 2decho findings .2decho elaborated regional wall motion abnormalities in detail. 4 patients ECG showed antero lateral wall infarction, 2d echo in these patients showed anterolateral RWMA .ECG findings are also well correlated with 2decho in these patients 3. This shows echocardiography located further regional wall motion abnormality, than seen on electrocardiography. 10 patients showed inferior wall MI , When Echo was done in these patients, 8 patients (47.05%) showed inferior wall myocardial RWMA, 2 patients (11.76%) had inferior wall and right ventricle RWMA, 2D ECHO was well correlated and elaborated regional wall motion abnormality than ECG. ECG of 7 patients showed inferior and right ventricle wall, 2D ECHO in these patients also well correlated. 4 patients out of 50 patients had antero- inferior wall myocardial infarction on ECG. When echo was done in these patients, 3(75%) patients had global hypokinesia and 1 patient had anterior and inferior wall hypokinesia.in these patients ECG findings are well correlated with 2decho findings. Echo elaborated regional wall motion abnormalities in detail. According to Penco M *et al*. ECG and echocardiography showed good correlation in evaluating the infarct site, but echo showed larger extension. Regarding the infarct site, a good correlation was found in anterior acute myocardial infarction but not in inferior acute myocardial infarction. Our study is also correlating with the above findings. Shah *et al*. in his study agreed that ECG and echocardiography have good correlation to localize the site of infarction, but in echocardiography segmental wall motion abnormalities are frequently more extensive than on ECG and may occur in areas, apparently remote from the putatively infracted zone . In our study, this is also seen to be true. According to Scharti *et al* 2D echocardiography should be regarded as a supporting method to the ECG but not as an essential one in the diagnosis of acute myocardial infarction. According to Kuch, ECG and 2D Echo are compatible methods but not replaceable one. Mahajan Devinder Singh concluded that localization of the site of myocardial infarction on ECG correlated broadly with that seen on Echocardiography and was able to elaborate regional wall motion abnormalities in detail i.e., Echo could detect abnormalities in those areas which could not be shown by ECG. Our study is also almost correlating with the findings of Penco M, Shah, Scharti *et al*., Kuch, Izumi *et al*. And Mahajan Devinder Singh, and electrocardiography and echocardiography have a good correlation in localizing the site of infarction but Echo was able to elaborate the site of infarction in much greater detail than ECG.For further localization of site of infarction coronary angiogram is required.

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Source of Support: None Declared
Conflict of Interest: None Declared