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ECHOCARDIOGRAPHIC PROFILE OF MYOCARDIAL INFARCTION PATIENTS AND ITS CLINICAL CORRELATION

Medicine

Dr.Ram Naresh Gupta Associate Professor in the Department of Medicine, Government Medical College, Ambikapur , Surguja ,C.G.

Dr. P. R Shivhare* Assistant Professor in the Department of Surgery, Government Medical College, Ambikapur , Surguja ,C.G.*Corresponding Author

ABSTRACT

Myocardial infarction (MI) is also known as heart attack. Acute myocardial infarction can be diagnosed when there was prolonged chest discomfort, appearance of Q wave in the electrocardiogram. Echocardiography is extremely valuable in assessment of cardiac performance. This study was done in the department of medicine, medical college Jabalpur M.P between the periods of 1992-1993. Total 40 patients (30 male and 10 female) within age group of 31-80 years who have myocardial infarction were selected for this study. The result of this study shows that the Myocardial infarction occurs earlier in male as compared to female, Hypertension was found in about one third and hypercholesterolemia in more than 50% of study population, 80% of males patients were chronic smoker, Anterior wall infarction 25 patients (62%) is the most common type of myocardial infarction followed by combined, inferior, subendocardial wall infarction. In conclusion it can be said that diagnosis of myocardial infarction, established by characteristic history, clinical findings, blood biochemical analysis and electrocardiographic changes, can be correlated with echocardiography.

KEYWORDS

Myocardial Infarction, Echocardiography , Electrocardiography, Arrhythmia.

INTRODUCTION:-

Ischemic heart disease is defined by the world health organization as "Myocardial impairment due to unevenness between coronary blood flow and myocardial requirements caused by changes in coronary circulation.[1] with better diagnosis facilities ,prevalence of ischemia heart disease in our country is essential as to be major cause of death and disability. The ischemic heart disease can manifest in variety of syndrome they are Angina pectoris (including acute coronary insufficiency), Myocardial infarction, disturbances of conduction (heart blocks) or rhythm (aahythmias), cardiomegaly. The term myocardial infarction is applied to the region of cell death (Necrosis) occurring in the zone of reduced or absent arterial flow from partial or complete obstruction of a coronary artery.[2] since then an appreciative progress has been made in early diagnosis , management and rehabilitation in patients of myocardial infarction. Acute myocardial infarction can be diagnosed by prolonged chest pain that is characteristic of myocardial ischemia, appearance of Q waves or characteristic elevation of ST segment or T waves changes in the electrocardiogram and elevation of the blood level of cardiac enzymes. Old myocardial infarction is diagnosed by history of acute myocardial infarction. , electrocardiogram evidence of myocardial infarction i.e. Pathological Q waves, impaired cardiac performance as evidenced by echocardiography. The term echocardiography refers to a group tests that utilize ultrasound to examine the heart and record information in the form of echoes i.e. reflected sonic waves. [3,4,5]

With different angulations of transducer the relevant information regarding cardiac anatomy is obtained. The heart structures are seen through a tunnel and therefore multiple angulations of transducer give more information. The left parasternal position gives the greatest information as the ultrasonic beam traverses the heart from right ventricle to the posterior wall of either to left atrium or left ventricle depending on its angle.[6] All the common complication of acute myocardial infarction like left ventricular aneurysm[7], Pseudoaneurysm[8], Aneurysmal dilation and subsequent perforation of ventricular septum[9], right ventricular infarction[10], Mural thrombus[11] and other complication such as mitral regurgitation[12] and pericardial effusion[13] are easily detected by echocardiographic technique .

The myocardial infarction diagnosis may be divided into 3 group they are nospecific indexes of tissue necrosis and inflammation, the electrocardiogram (the three pathophysiological events occur either in sequence or simultaneously in an acute myocardial infarction-ischemia change in T waves , injury change in ST segment and infarction changes in QRS complex) and serum enzyme changes such as transaminase (Asparate aminotransferase AST or SGOT), lactic dehydrogenase (LDH), creatine kinase (CK).[14] The aims of present study was to evaluate echocardiographic profile of myocardial infarction patients and its clinical correlation.

MATERIAL AND METHODS:-

This study was carried out in Department of Medicine, Medical College Jabalpur (M.P). The total 40 patients (30 male and 10 female) within age group of 31-80 years patients who have symptoms, sign and characteristic electrocardiographic changes suggestive of myocardial infarction and admitted to intensive coronary care unit, during 1992-93 were considered for this study. Detailed history recorded according to the proforma which include demographic data (Name, Age , Sex ,Occupation and Address of patients), Medical history (Hypertension ,Diabetes, IHD, Old myocardial infarction, family history, addiction to smoking and alcoholism), Physical examination (General examination i.e. pallor, cyanosis , perspiration ,pulse and blood pressure . systemic examination especially basal crepts in respiratory system, heart sounds and any added sound). Investigations that included blood counts, hemoglobin estimation , presence of sugar and albumin in urine ,serum cholesterol ,blood sugar ,blood urea, SGOT + SGPT, CPK enzyme (24 hrs of onset of chest pain in ICCU). Electrocardiography performed on 12 lead surfaces, BPL cardiac EKG machine at a paper speed of 25 mm per minute daily till the date of echocardiography. Those patients, who were diagnosed myocardial infarction by history, raised serum enzyme levels and electrocardiographically were subjected to echocardiographic examination as early as possible after admission. Echocardiography (Ultrasonography) machine is SDU 500 SHIMADZU model made in Japan. The various measurements, data were taken according to proforma and recorded in master chart.

RESULT :-

Forty cases of acute myocardial infarction were taken for the study. The result of various observations is summarized below.

1. Myocardial infarction occurs earlier in male as compared to female. The mean age for male was 50 years for females it was 58 years.
2. Hypertension was found in about one third of study population.
3. Hypercholesterolaemia was found in more than 50% of study population.
4. More than 80% of male's patients were chronic smoker.
5. Anterior wall infarction is the most common type of myocardial infarction. In this study 25 patients were anterior wall, which is 62% of total occurrence of AMI.
6. Arrhythmias were most common with anteroinferior infarction i.e. 90% and least common with inferior wall infarction i.e. 20%.
7. Patient with anterior wall infarction had dyskinesia, akesia or hypokinesia , those with inferior wall infarction had hypokinesia and in anteroinferior infarction dyskinesia was more commonly seen.

DISCUSSION:-

Myocardial infarction is one of the commonest public health problems

in countries. Patients of myocardial infarction mostly present with typical history of chest pain radiates to the left arm and perspiration. The most important investigation is electrocardiography, enzyme assay and echocardiography for conformation, localization and detecting complication of myocardial infarction. The present study aims the echocardiography finding and its clinical correlation in patients of myocardial infarction.

In the present study a total of 40 cases (30 male and 10 female) between age group 31 to 79 years. The mean age for male was 50 years and for female patients was 58 years. In male occurrence of myocardial infarction is earlier as compared to female. In the present study hypertension has a major risk factor for the development of coronary atherosclerosis that extends across racial, gender and age categories[17]. In this study about one third of cases were hypertensive. Table no. 01.

The use of tobacco products development a risk of coronary artery disease and may accelerate the process of atherosclerosis by a variety of mechanism[18]. In the present study out of 30 males, 25 were addiction to bidi or cigarette smoking.

Dyslipidemia is a major risk factor of coronary artery disease has numerous forms, from hypercholesterolemia to hypoalphali poproteinemia.[19] In the present study out of 40 cases 23 cases (57%) were having high cholesterol level.

Henger et al (1979) were among the first to report on the detection and localization of acute myocardial infarction by cross sectional echocardiography.[15] They found good agreement between the site of infarction determined by echocardiography and that determined by electrocardiography Horowitz et al (1982)[16] showed that cross sectional echocardiography can diagnose infarction before the results of other tests are known.

In the study of 40 cases, 25 had anterior wall infarction, 5 had inferior wall infarction, 1 patient had subendocardial infarction and 9 had combined anterior and inferior wall infarction (table-2), Fig.01, Fig.02. The anterior infarct subgroup includes patients with pathological Q waves more than 40 msec that were localized to one or more of the precardial leads. The inferior infarcts subgroups contained patients with pathological Q waves on lead II, III and aVF. The subendocardial subgroup includes no pathological Q wave, but only tall, symmetrical inverted T waves. Out of 25 patients of anterior infarcts group hypokinesia was demonstrated in 15 patients, dyskinesia in 5 patients, akenesia in 4 patients and normal echocardiographic study was found in one patients. Hypokinesia was demonstrated in 4 patients out of 5 in inferior infarction and in one patient there was dyskinesia. Dyssynergy was observed in 5 out of 9 patients in combined group. So largest extent of dyssynergy was observed in an anteroinferior (Combined) infarction. Miller et al in (1972-1974)[20] also found that 80% of patients with ECG evidence of an anterior infarction demonstrated dyskinesia or akinesia . In contrast most of the patients with inferior wall infarction showed hypokinesia.

The reported incidence of arrhythmias in acute myocardial infarction varies between 60 to 80 % in the previous studies conducted by imperial et al[22], Jullien et al[23] Robinson et al[24]. The incidence of arrhythmias associated with this present study was 55% in combined male and female patients.

In the present study the incidence of arrhythmis was higest in combined anteroinferior infarction and lowest in inferior wall infarction (Table-2). Higher incidence of arrhythmia in anterior wall infarction is also reported by Anna malai et al[25].

In our study out of 40 Patients diagnosed myocardial infarction by clinical and ECG finding 38 patients had wall motion abnormalities and two patients had normal echo study, one of them was subendocardial (non transmural) infarction and one patient was of anteroseptal infarction , so this present study showed similar figure with other studies. Similar types of results were obtained in the study of Nixon ,J.V et.al.[21].

Abrams, D.L et al [26] and Faxon D.P et al [27] found 8 to 15 % patients of myocardial infarction were shown ventricular aneurysm in 2D echocardiography. In our study of 40 patients 10 had ventricular aneurysm, which is slightly higher than previous studies. Clinically by EKG only 3 patients were suspected for aneurysm.

Certain complication of myocardial infarction are detected by echocardiography of which ventricular aneurysm, mural thrombi, myocardial rupture (rupture of free wall, rupture of interventricular septum, rupture of papillary muscle), mitral regurgitation and pericardial effusion are important ones

CONCLUSION:-

In conclusion it can be said that diagnosis of myocardial infarction, established by characteristic history, clinical findings, blood biochemical analysis and electrocardiographic changes, can be correlated with echocardiography. The echocardiography can be used for early diagnosis and detection of complications of myocardial infarction, which is non invasive, less expensive, easy to perform can be repeatedly done and more sensitive.

TABLE:-01.Distribution of male and female patients was according to Age, No. of patients, History of Hypertension in various Age, History of Myocardial Infarction various Age and History of smoking.

Age group	No. of patients		History of Hypertension in various Age		History of Myocardial Infarction various Age		History of smoking
	Male	Female	Male	Female	Male	Female	Male
31-40 Years	6 (20%)	-	-		1 (16.6%)		4 (66.5%)
41-50 Years	9 (30%)	4 (40%)	4 (44.4%)	1 (25%)	4 (44.4%)	1 (25%)	8 (88.9%)
51-60 Years	10 (33.3%)	3 (30%)	5 (50%)	1 (33.3%)	5(55%)	1 (33.3%)	8 (80%)
61-70 Years	4 (13.2%)	2 (20%)	-	-	2 (50%)	-	4 (100%)
71-80 Years	1 (3.3%)	1 (10%)	1 (100%)	1 (100%)	-	-	1 (100%)
Total	30 (100%)	10 (100%)	10 (33.3%)	3(30%)	12 (40%)	2 (20%)	25 (83.3%)

TABLE:-02. Location of myocardial infarction detected by electrocardiography in no. of cases and association of arrhythmias in various type of myocardial infarction

Site Of MI	No. Of Cases		Arrhythmia In Various Type Of MI	
	Male	Female	Male	Female
Anterior Wall	17(56.6%)	8(80%)	8(47.2%)	5(62.5%)
Inferior Wall	4(13.3%)	1(10%)	1(25%)	-
Subendocardial	1(3.3%)	-	-	-
Combined	8(26.6%)	1(10%)	7(87.5%)	1(100%)
Total	30(100%)	10(100%)	16(53.33%)	6(60%)

Fig.01:- ECG of extensive Anterior wall myocardial infarction

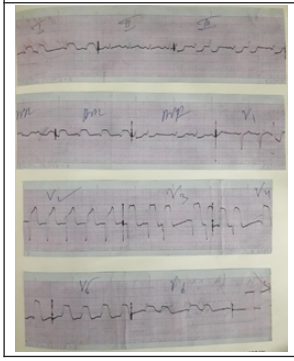
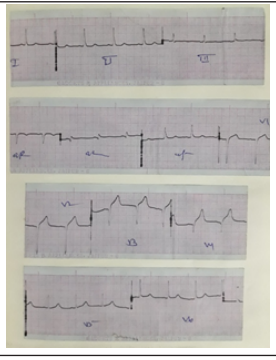


Fig.02:- ECG of Inferior wall myocardial infarction



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Conflict of Interest:-No conflict of interest.

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