

PATTERNS OF PRESENTATION OF CHRONIC ISCHEMIC HEART DISEASE WITH AND WITHOUT PREVIOUS MYOCARDIAL INFARCTION

Rehan Ahmad, Aftab Rabbani, Zahid Aslam Awan*

Department of Medicine, Ayub Medical College, Abbottabad, Pakistan *Department of Cardiology, PGMI, Hayatabad Medical Complex, Peshawar, Pakistan

Background: The prevalence of Ischemic Heart Disease (IHD) is on the rise, from increasing lifespan of population and availability of better medical facilities. We studied chronic IHD cases with and without previous myocardial infarction, in Hazara, NWFP, Pakistan to evaluate left ventricular (LV) dysfunction, wall motion abnormalities and complications of IHD. **Methods:** All patients presenting with history of chest pain in Medical 'C' Unit, Ayub Teaching Hospital, Abbottabad from June 2004 to May 2005 were included in the study. Patients with non-cardiac chest pain were excluded from the study. Cases with congenital and rheumatic heart disease, cardiomyopathies, unstable angina and acute MI were excluded. Patients with IHD with or without myocardial infarction (MI) were studied for left ventricular dysfunction (ejection fraction, left atrial size, E/A ratio), wall motion abnormalities and complications of IHD (Mitral regurgitation, Ventricular Septal Defect (VSD), LV aneurysm, LV clot). Clinical and echocardiographic evaluation was done in each case. **Results:** Out of 183 cases of chronic IHD, 123 patients were without previous MI and 60 had had previous MI. Ejection fraction (EF) was 45 ± 15 in the group without MI and $35\pm 11\%$ in cases with MI. Left Atrium (LA) size was 35 ± 6 mm and 39 ± 4 mm in the two groups respectively. LV diastolic dysfunction was seen in 17% in the first and 24% in the second group respectively. Global hypokinesia was seen in 8% and 17% in the 2 groups respectively. Regional Wall Motion Abnormality (RWMA) was observed in 12% in patients without MI and in 58% cases with MI. Mitral regurgitation was seen in 10 and 20% in the 2 groups respectively LV clots, VSD, LV and aneurysm were seen in 8.4, 5, and 6.5% respectively, only in cases with previous MI. **Conclusion:** LV dysfunction, wall motion abnormalities and mitral regurgitation were more common in IHD cases with previous heart attack.

Keywords: Ischemic heart disease, left ventricular dysfunction, Wall motion abnormalities, Mitral regurgitation

INTRODUCTION

Ischemic Heart Disease (IHD) remains a major health problem and number one killer world wide. With the aging population and increasing survival rate of acute MI, overall burden of chronic IHD is on the rise. It has been reported that for every recognised heart attack there are 30 cases of chronic IHD. In fact chronic stable angina is the principal manifestation of IHD in 60% of cases.¹

Such cases are commonly evaluated by the resting ECG and chest radiograph. This does not give a detailed insight into the quantitative aspect of disease, functional status, complications and prognostic considerations.

Echocardiography could be very useful for the evaluation of chronic IHD and this modality needs to be more utilised in such clinical condition.

We studied chronic IHD cases with and without previous myocardial infarction, in Hazara, NWFP, Pakistan to evaluate left ventricular (LV) dysfunction, wall motion abnormalities and complications of IHD.

PATIENTS AND METHODS

This is a case series of clinical and echocardiographic study of 183 cases of chronic IHD, evaluated during one year period from June 2004 to May 2005. It was carried out at the Department of Medicine, Ayub Teaching Hospital, Ayub Medical College, Abbottabad.

Patients' age and gender was noted. History of chronic anginal chest pain and previous heart attack was specifically elicited. Patients were clinically examined for IHD and its complications. ECG was done in all cases. Patients of chronic IHD were thus divided into 2 groups, i.e., with and without previous myocardial infarction.

Echocardiography was done with Caris Plus, colour Doppler echocardiographic system with CW (Continuous wave) Doppler capability. Cardiac chamber dimensions and ejection fraction was noted. LV diastolic function was determined measuring E/A ratio of mitral valve inflow velocity. Regional and global wall motion abnormalities were evaluated.

Complications such as mitral regurgitation, ventricular septal defects LV aneurysms and LV clots were noted, in both the groups.

Cases with congenital and rheumatic heart disease were excluded. Cardiomyopathy cases were not included in the study. Cases with unstable angina and acute MI were also excluded.

Consecutive cases with history of chronic IHD were included with evidence of IHD on resting or stress ECG. This included case of chronic stable angina, post MI cases and cases with previous coronary artery bypass surgery.

RESULTS

A total of 183 cases of chronic stable IHD were studied. Out of 183 patients 157 (85.79%) were male and 26 (14.21%) were female, their mean age was 55±15 years. Male to female ratio was 6:1. One hundred and twenty-three (67.21%) had IHD without MI and 60 (32.79%) had previous MI.

Wall motion study revealed global hypokinesia in 8.63% cases of stable IHD without MI, and in 17% of cases with previous MI. Regional Wall Motion Abnormalities (RWMA) were noted in 12% of stable IHD cases and in 58% of post MI cases. LV aneurysm, LV clot and VSD (post MI) were detected in 6.5%, 8.4%, and 5% cases respectively, all in the post MI group. Mitral regurgitation was noted in 20% of post MI cases and in 10% cases without MI. The results are incorporated in Tables-1, 2, 3).

Table-1: Subsets of chronic IHD cases (n=183)

GROUP	Number	%
IHD with previous MI	60	32.79
IHD cases without MI	123	67.21

Table-2: Complications of chronic IHD

Complication	Incidence (n=183)	IHD Without MI (n=123)	IHD With MI (n=60)
LV clot	5 (2.18%)	0	5 (8.45)
VSD (post MI)	3 (1.63%)	0	3 (5%)
LV aneurysm	4 (2.18%)	0	4 (6.5%)
Mitral regurgitation.	24 (13.7%)	12 (10%)	12 (20%)

Table-3: LV functions in chronic IHD

LV function	Total	IHD Without MI	IHD With MI
Mean ejection fraction	40±15	45±15	35±11
Mean LA size (mm)	38±6	35±6	39±4
LV diastolic dysfunction	35/183 (19%)	20/123 (16%)	15/60 (25%)

DISCUSSION

Chronic IHD is a major health problem worldwide as its sufferers run in millions. Its prevalence increases with age and it is 4 to 6 times more common in males.¹ The mean age of IHD cases in our series was 55±11 and

male to female ratio of 6 to 1. Complication rate is more in the post MI cases such as impaired LV functions, CCF, and sudden death. This is similar to that reported earlier.^{1,2}

Echocardiography remains unsurpassed in assessment of LV function, wall motion abnormalities, regurgitant valvular defects and intracardiac clots.^{3,4} Other haemodynamic abnormalities such as pulmonary hypertension, RV dilatation, tricuspid regurgitation are also adequately assessed by echocardiography.^{5,6}

Left ventricular systolic dysfunction projects the guarded prognosis in chronic IHD. Ejection fraction less than 35% is associated with >3% annual mortality. Echocardiographic assessment of LV function corresponds well with angiographic measurement of ejection fraction.⁶

Mean EF in our patients was 40±18 in our series and it was worse in the post MI group. Same was the case with LV diastolic dysfunction. A study suggested long term development of CCF in the post MI cases with diastolic dysfunction, although this relationship is not as clear as with systolic LV dysfunction causing CCF.⁶

Wall motion abnormalities were seen in twice the number of cases with history of previous MI. Wall motion abnormalities are another useful parameter. Regional WMA may change or resolve with the medical or interventional therapy.^{7,8} Presence of RWMA without previous MI indicates significant IHD.⁷ Location of RWMA correlates well with the site of IHD and previous MI. There could be other causes for the RWMA such as bundle branch block, RV overload and pace-maker driven cardiac rhythm.⁹ Major complications like CCF, cardiac thrombi and systemic thromboembolism is more common with severe WMA.^{10,11} Assynergy and lack of hyperkinesis remote to the site of previous MI carries worse prognosis.^{12,13} Although normal wall motion, with IHD does not rule out ischemia, it carries smaller risk and better prognosis.¹³ Wall motion abnormalities could result from acute infarction, post infarction scarring or chronic IHD causing hibernating myocardial behaviour. Echocardiography cannot differentiate between these syndromes; clinical correlating has to be made.¹⁴ RWMA was seen in 17% in post-MI cases while global hypokinesia was noted in only 8.63%. It was due to the fact that we excluded cases of global hypokinesia from our study, where dilated cardiomyopathy could not be ruled out. Moreover the WMA was predominantly seen in the post MI group.

Echocardiography could easily detect IHD complications like LV thrombi, regurgitant lesions, WMA and post-infarction VSD. Mitral regurgitation was seen in 24% of our cases and has prognostic implications as well.^{15,16}

Left ventricular systolic function was worse with previous infarction and carries adverse prognosis. Echocardiography was instrumental in assessing these differential features in the two subgroups of chronic IHD. Left ventricular thrombi are especially common with significant wall motion abnormality. It may be fixed or mobile, which are more likely to embolise.^{17,18}

CONCLUSION

Left Ventricular dysfunction, wall motion abnormalities and mitral regurgitation are more common in IHD cases with previous myocardial infarction. Colour doppler echocardiography is instrumental in assessing such cases.

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Address for Correspondence:

Dr. Rehan Ahmed, Associate Professor, Department of Medicine, Unit 'C', Ayub Medical College, Abbottabad. Pakistan. **Tel:** +92-992-381277
Email: reehhan@hotmail.com