ORIGINAL ARTICLE

Pattern of Chronic Rheumatic Valvular Lesion in Patients Undergoing Echocardiography – A study of 510 cases

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Abstract :

This observational study of 510 cases of chronic rheumatic valvular diseases was carried out in the Department of Cardiology in the National Center for Control of Rheumatic Fever and Heart Diseases (NCCRF&HD) from January 2007 to October 2007 with the main objective to find out the pattern of distribution of rheumatic valvular lesion in the community and whether this trend is changing over time or not. All the patients underwent a thorough clinical examinations followed by electrocardiographic, radiographic and finally echocardiographic examinations. Non-rheumatic cases of valvular lesion and functional valvular lesion were excluded from the study. The study revealed that there were 52.5% female and 47.5% male with mean age of presentation of 32.86 ± 12.90 years. Isolated mitral valve involvement was found in 57.25% cases, isolated aortic valve lesion in 8.8% cases and combined valve lesion in 33.9% cases. Mitral valve lesion was significantly higher in female population and aortic valve lesion in male population. Pure mitral stenosis was found in 22.9% cases.

Introduction :

Rheumatic fever (RF) and rheumatic heart disease (RHD) are non-supportive complications of group A Beta haemolytic streptococcal pharyngitis which is considered to be the most common cause of acquired heart disease in children and young adults world-wide[1]. The incidence and prevalence of RHD are markedly variable in different countries[2]. Despite a documented decrease in the incidence of acute RF and similar documented decrease in the prevalence of RHD in industrialized countries during the past five decades, it remains a medical and public health problem in both developed and developing countries even at the beginning of twenty first century.

Rheumatic heart disease places a heavy economic burden on the health care system in middle and low income group countries because of costs of medical treatment and heart valve surgery, and also because it is a disease of young adults, who are the most economically active group of any population.

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Although incidence and prevalence of RF and RHD is much reduced in last two decades, its course in this country some times become more fulminant with an unpredictable outcome and surgical intervention is eventually required for most of the patients.

Echocardiography is the key investigation for diagnosis of rheumatic valvular heart disease. The method is non-invasive, relatively available with affordable cost and provides accurate diagnosis provided it is done by an efficient and skilled hand.

National Centre for Control of Rheumatic Fever and Heart Disease (NCCRF&HD) is the only centre in the country which is dealing with a large number of patients with RF and RHD almost for the last two decades. Patients are referred mostly from rural health centres of different regions of the country and even from different tertiary health care hospitals to this centre. So, pattern of the valvular lesions in rheumatic heart disease would be almost exact representation of that is in general population.

In chronic RHD, mitral valve is affected in more than 90% of cases and aortic valve is the next frequently affected valve[1]. Pure mitral stenosis occupies a great portion of total RHD in Bangladesh and two third of them occur in female patients.

With above information in hand this study was undertaken with following objectives:

- To find out the pattern of different types of valvular lesions in patients with rheumatic heart disease and to evaluate whether this pattern is changing over time.
- To find out the age and sex distribution of the patients with rheumatic valvular diseases and whether the pattern is changing over time.

Materials and method :

The study was carried out in the echocardiography laboratory of the Cardiology Department of National Center for Control of Rheumatic Fever and Heart Diseases from 15 January 2007 to 15 October 2007. Any patient clinically suspected to have valvular heart diseases were included in the study.

Non-rheumatic cases of valvular heart diseases i.e. congenital, degenerative, collagen disease were excluded from the study. Functional tricuspid regurgitation as a consequence of mitral valve disease (MVD) were not entitled as a separate rheumatic heart valve lesion.

Detailed medical history and through clinical examination were done in every cases. Electrocardiogram and chest X-ray postero-anterior view was also done. Then all the patients were investigated with blood counts, C-reactive protein and anti-streptolysin-O titers to find out the disease activity if is present.

2-D, M-Mode and Color Doppler echocardiography was performed in every casess by Toshiba Color Doppler Machine and Nemio 30, 2.5-3.5 MHz probe were used.

Echocardiography was done by using all the standard views including left parasternal long axis, short axis apical, subcostal and suprasternal views. Apical 4 or 5 or 2 chamber views were used for Doppler echocardiography.

Statistical analysis was done in computer and numerical data were expressed in mean±SD and comparison between same group is expressed by the use of un-paired t-test and Z test. P value <0.05 is taken as highly significant.

Results :

Table-I shows the age range of study population which ranges from three years to 72 years. Majority of study population belonged to 30-40 years age group (27.05%) in comparison to 24.31% in 10-20 years, 22.74% in 30-40 years 14.11% in 3-10 years and 11.76% in more than 40 years age group. Majority (52.55%) of the study population were female.

Table I: Age and sex distribution of patients with valvular lesion (n=510)

Age range in years	Number	Percentage
5-10	72	14.11
10-20	124	24.31
20-30	116	22.74
30-40	138	27.05
>40	60	11.76
Sex	**Number**	**Percentage**
Male	242	47.45
Female	268	52.55

Table II: Pattern of valvular lesion (n=510)

Type of Lesion	Number	Percentage
Isolated mitral valve	292	57.25
Isolated aortic valve	45	8.82
Multiple valves	173	33.92

Table III: Sex distribution of different valve lesion (n=510)

Valve involvement	Number of male patients (%)	Number of female patients (%)	P value
Isolated mitral valve	98 (19.21)	194 (38.04)	0.002
Isolated aortic valve	33 (6.47)	12 (2.35)	0.001
Multiple valves	111 (27.76)	62 (12.16)	0.002

Table IV: Sex distribution of patients with mitral valvular deaseases (n=292)

Valve lesion	Number of male patients (%)	Number of female patients (%)	P value
Mitral stenosis (MS)	45 (15.41)	72 (24.65)	0.0045
Mitral regurgitation (MR)	35 (11.98)	50 (17.12)	0.07
Mitral stenosis with mitral regurgitation (MS with MR)	18 (6.16)	72 (24.65)	0.001

Table V: Distribution of aortic valve lesion (n=45)

Type of lesion	Number of male patients (%)	Number of female patients (%)	P value
Aortic regurgitation (AR)	15 (33.33)	04 (8.89)	19 (42.22)
Aortic stenosis (AS)	07 (15.56)	03 (6.67)	10 (22.23)
Aortic stenosis with aortic regurgitation (AS with AR)	11 (24.44)	05 (11.12)	16 (35.56)

Table VI: Distribution of multiple valve lesion (n=173)

Type of lesion	Number	Percentage
MR+AR	52	30
MR+AS	28	16.2
MS+AR	58	33.5
MS+AS	19	11
MS+MR+AS+AR	12	6.9
MS+MR+AR+TS	02	1.2
MS+MR+AS+AR+PR	02	1.2

MS= Mitral stenosis, AS= Aortic stenosis, MR= Mitral regurgitation, AR= Aortic regurgitation, TS= Tricuspid stenosis, PR= Pulmonary regurgitation

Table-II shows the distribution of valvular lesions among the study population. Isolated mitral valve lesions were found in highest number of cases (57.25%) followed by multiple valve lesion (33.92%) cases and isolated aortic valve lesion was found in 45 cases (8.82%).

Table-III shows the pattern of involvement of mitral, aortic and combined valve lesions in both male and female patients. Isolated mitral valve lesion is common in female patients which is 38% and isolated aortic valve involvement is common in male (6.47%) and multiple valve lesion was found more in male patients (27.76%) than in female patients (12.16%).

Table-IV presents the sex distribution of patient of mitral valve diseases showing that the pure mitral stenosis and combined mitral stenosis and regurgitation is more common in female than male 24.65% vs 15.41% and 24.65% vs 6.16% respectively. Isolated mitral regurgitation cases are also more common in female (17.12% vs 11.98%).

Table-V shows that aortic regurgitation is the predominant aortic valve lesions (42.2%) present in both sexes. Combined lesions are the next (35.56%) and isolated stenotic lesion are the least (22.23%) among the lesions. Male patient has higher percentages of all types of aortic valve lesion in comparison to female.

Among the combined valvular lesions, mitral and aortic valve lesions combination comprises bulk majority of the cases (97.6%). There were two (1.2%) cases of mitral, aortic and tricuspid valve combined lesion and two (1.2%) cases of mitral, aortic and pulmonary valve combined lesion.

Discussion :

In the present study, 510 patients who attended the out patient department of

NCCRF&HD during the period of 15th January to 15th October, and who were clinically diagnosed as having chronic rheumatic valvular heart disease were subsequently evaluated by X-ray chest P/A view, resting 12-lead ECG and color doppler echocardiography.

Among the cases of valve lesion mitral valve was fund to be involved in great majority of the cases (57.25%). Findings is consistent with the observation of Mahmud et al and Siddique et al, where they found that mitral valve was involved in 63% and 60% of cases respectively[3,4].

Among the cases of mitral vale involvement it was observed that isolated mitral stenosis was found in 40% cases and finding is consistent with the findings of Siddique et al but contrary to the findings of Mahmud et al where she found predominant mitral valve lesion was mitral regurgitation, and mitral stenosis was observed in 30% of cases. This was probably due to the fact that large percentage of her patients were suffering from acute rheumatic carditis. In another study isolated mitral stenosis accounted for about 25% of all cases[5]. This finding was also not compatible with this study.

Mitral regurgitation was found in 29% cases and combined mitral stenosis and regurgitation was found in 31% cases. Mahmud et al and Siddique et al found combined valve lesion in 24% and 28% cases respectively.

In this study isolated aortic valve lesion comprised only 8.82% of total valve lesion and it is compatible with the observation of Siddique et al where they found it in 9.45% but on the contrary it was found in higher percentage (16%) of cases in the study by Mahmud et al. In aortic valve disease, aortic regurgitation was more common than aortic stenosis (42.2% vs 22.2%) and it is consistent with findings of Siddique et al and Mahmud et al. Combined aortic valve lesion was more common than isolated aortic stenosis (35.56 vs 22.23%) which was comparable with the findings of Mahmud et al but contrary to the findings of Siddique et al.

Multiple valvular lesion occupied 33.92% cases which is approximately close to the findings of other studies done in Bangladesh. Among the combined lesions, MS with AR was the predominant lesion (33.5%) followed by MR and AR which is also consistent with some studies done in Bangladesh[6].

In combined valve lesion, there were two (1.2%) cases of tricuspid valve and two (1.2%) cases of pulmonary valve lesion. Mitral valve and tricuspid combined lesions occured in less than 5% cases[7].

Regarding gender distribution of valve lesions, female to male ratio was 1.1:1 having slight female preponderance which is not consistent with findings of Hossain et al and Siddique et al where they found almost equal distribution of sex[6]. Isolated mitral valve lesion was 1.9 times more common in female. Isolated aortic valve lesion was 2.75 times more common in males where as Siddique et al found five times more predominance in males.

Mean age of presentation of valvular lesions in this study was 32.86±12.90 years which is consistent with the findings of Wood and also Glenn et al, who found the age to be 37.6 years [8,9]. Observation is also compatible with the study of Siddique et al which was done in Bangabandhu Sheikh Mujib Medical University.

So, the bulk of rheumatic heart disease is due to mitral valve lesion among which mitral stenosis occupied top most position. The findings of this study indicate that the magnitude of the problems is not changed and pattern of valvular lesion in this country is similar to that of developed countries and it is not changing over time.

This study invites a broad based multi-centered study for evaluation of different aspects of valvular lesion incorporating National Institute of Cardiovascular Diseases (NICVD), National Heart Foundation Hospital, other non-governmental cardiac hospital, and cardiology department of different medical college hospitals. That will actually give the true picture of whole country and scenario of valvular heart diseases of the nation.

It is observed that valvular lesions were affecting the male in their economically productive age and female mostly in their reproductive age, creating a huge economic loss and social burden. So, apart from the steps to prevent rheumatic heart disease, adequate management of valvular lesions with an affordable cost is also necessary. Not only this, this treatment facilities should be made available in the reach of the common people. At the same time search should be continued to find out other cost effective modalities of treatment that can be provided to the poor people with limited health resources.

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