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Pattern of Valvular Lesions in Rheumatic Heart Disease among Females: A Single Centre Experience in South India

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Abstract: ***Rheumatic heart disease continues to be major health problem in developing countries like India and one of the leading causes of disability and premature death. RHD is a disease of involvement of mitral valve with associated other valves. The literature shows that mitral stenosis is the major lesion in female, but data of other lesions are conflicting. The aim of this study is to analyses the pattern of valvular involvement in rheumatic heart disease (RHD) in females. This retrospective study was conducted in Department of Cardiology, at Sri Jayadeva Institute of Cardiovascular Sciences and Research, Bengaluru. The study was conducted on female patients who were diagnosed with RHD based on echocardiographic examination. Total 5,692 female patients were admitted during the study period out of which 1,199 patients were diagnosed with RHD. Isolated severe mitral stenosis (MS) was found the most common lesion 665 (55.46%) followed by multivalvular lesion which accounted 202 (16. 84%).The mitral valve lesion is observed as the most common lesion. Particularly, mitral stenosis leads to significant comorbidities and premature death. There is a need for the intensive primary and secondary prophylaxis of acute rheumatic fever and rheumatic heart disease to prevent development of severe form of the disease.***

Keywords: Rheumatic Heart Disease, Rheumatic Fever, Mitral stenosis, Aortic regurgitation

1. Introduction

Rheumatic heart disease (RHD) is the most common cardiovascular disease in children and young adults [1]. Although it has declined in developed countries, it is still a major public health problem in developing world [2]. In India RHD is one of the leading causes of premature death and disability [3]. The prevalence is quite high in both rural as well as urban population of India[4], [5]. The contributing factors are poverty, illiteracy, overcrowding, and poor access to health. RHD results from recurrent attacks of rheumatic fever, which is an inflammatory disease that occurs as a delayed squeal to group a streptococcal pharyngitis [6]. One of the hallmarks of this multi system disease is carditis [7]. As the disease is usually recurrent [8] and progressive, rheumatic carditis ultimately leads to different valvular lesions. The rheumatic heart disease (RHD) tends to affect women of all ages. The RHD may pose serious problems in women especially in childbearing age. There are very few studies differentiating pattern of valvular involvement of RHD in women. The rheumatic heart disease (RHD), especially mitral stenosis (MS), occurs more often in women, but degenerative valve diseases affect both men and women with equal frequency. This study is aimed to understand the relative frequency of valvular lesions in female patients.

2. Literature Survey

Although literature suggests that in western countries RHD is very rare now, it is still a major public health problem in developing countries [2].RHD has been documented in Indian medical literature since the early nineteenth century, contrary to the popular belief that rheumatic fever (RF) and its sequelae were exclusively prevalent in temperate climates until the early twentieth century.Acute rheumatic fever (ARF) and its long-term squeal, RHD is a major health problem in children, adolescents and young adults [4]. Despite the tremendous progress made in cardiology, the menace of morbidity and mortality due to acute rheumatic fever and its consequences remain very high in India [3].The information regarding the burden of disease comes from hospital data, population-based studies and school surveys [5]. Hospital based data during 1945 to 1963 indicated that anywhere from 20 to 50 percent hospital admissions for cardiac patients were for RHD[6].Population based surveys for prevalence is very few and scattered.

3. Problem Definition

This study was conducted to evaluate the relative frequency of valvular lesions in female patients admitted with RHD, and according treatment to Cardiology Department, Sri Jayadeva Institute of Cardiovascular Sciences and Research, Bangalore.

4. Method/ Approach

This retrospective study was conducted in Department of Cardiology, at Sri Jayadeva Institute of Cardiovascular Sciences and Research, Bangalore. Being the major tertiary care hospital, patients are referred from all over south India like urban and rural part of Karnataka, Tamil Nadu, and Kerala and northeast India for diagnosis and management of heart diseases.

This study was conducted in patients admitted during January 2010 to January 2011 and diagnosed as having RHD based on echocardiographic examination. Total 20,395 patients were admitted during the said period and among them 5,692 (27.90 %) patients were female and 14,703 (72.10%) were male. The records of all patients admitted

during this period were examined. Detailed transthoracic two- dimensional and doppler studies were conducted by experienced echo cardiographers and reviewed by consultant cardiologists for the confirmation of diagnosis and further management.

Echocardiography was performed in accordance with the American College of Cardiology (ACC/ American Heart Association (AHA) guidelines using GE RT 6800 and Siemens Acuson CV-70 ultrasound system. All the female patients admitted were divided into different categories' i) Ischemic Heart Disease (IHD) ii) RHD, and iii) Congenital Heart Disease (CHD), iv) cardiomyopathies and v)Others. All those patients who had RHD were analysed in this study.

5. Result / Discussion

5.1. Result

Out of total female patients admission, nearly 2,932 (51.51%) patients were diagnosed with ischemic heart diseases and 1,199 (21.06%) were suffering from rheumatic heart diseases (Figure 1).

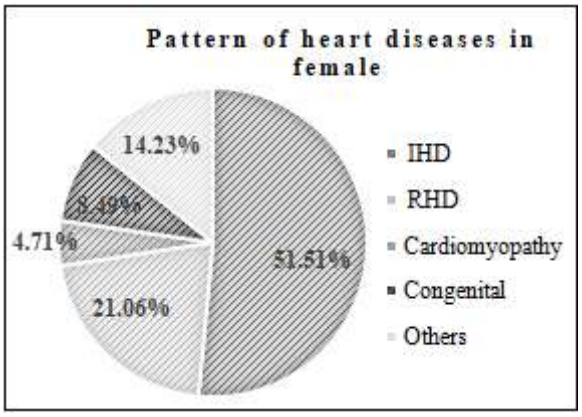

Figure 1: Pattern of heart diseases in females

The congenital heart diseases were diagnosed in 483 (8.48%) and cardiomyopathies like dilated cardiomyopathies, hypertrophic cardiomyopathies and restrictive cardiomyopathies accounted for 268 (4.7%). 810 (14.23%) females of total female admission were affected with complete heart block, primary pulmonary hypertension, severe anemia etc. classified as others in this study.

Table 1: Different valve lesions in female patients admitted with RHD

Valvular Lesion	Number of Patients	%(percentage) of Total RHD
Severe MS	665	55.46
Severe MR	137	11.42
Severe MS and MR	114	9.54
Severe AR	20	1.66
Severe AS	45	3.75
Severe AS and AR	16	1.33
Multivalvular (MS+MR+AS+AR)	202	16.84
Total	1199	100%

Table 1 is shows the pattern of dominant lesion and mixed lesions. In this study, severe mitral stenosis was found the most common lesion 665 (55.46%) followed by multivalvular lesion which accounted 16.84 % of total cases.

The next common valvular lesion was severe mitral regurgitation, affecting 137 (11.42%) of the total patients followed by severe MS observed in 114(9.4%) of the patients and 202 (16.84%) had mixed valvular disease. Severe aortic regurgitation was present in only 20 (1.66%) of the total patients. While in 1.33 % patients it was in combination with severe aortic stenosis and multivalvular lesions involvement it accounted 16.84% of total RHD patients.

Severe aortic stenosis was present in 3.37% but combined with other lesions it was present in 18.17% of total RHD patients.

Table 2: Number of procedures done

Therapeutic Procedure Done	Number of Patients	Percentage of total RHD
PTMC	518	43.20
MV Replacement	119	9.92
AVR	39	3.25
DVR	11	0.91
TV Annuloplasty	118	9.84
MV Repair	84	7.00
Total Procedure done	873	74.12

Table 2 indicates the treatment received by the patients in the form of percutaneous transvenous balloon mitral valvotomy (PTMC) or valve replacement. PTMC was the most the common procedure (43.20%) done followed by mitral valve replacement (9.92%). The mitral valve repair was done in 7% of the cases and tricuspid TV annuloplasty was performed in 9.84% of cases.

5.2. Discussion

The frequency of severe MS observed was higher as compared to other studies. Literature suggests that the overall prevalence estimated to be about 1.5-2/1000 in all age groups, in India. It also (total population about 1.3 billion) suggests that there are about 2.0 to 2.5 million patients of RHD in the country. There is a higher prevalence of rheumatic fever/rheumatic heart disease among females (7.2 per 1000) compared with males (5.28per 1000) [6][9]. Rheumatic mitral stenosis majorly affects women. This classical observation, reported many years ago, has remained unchanged in all the countries in which rheumatic fever continues to be a public health problem. The frequency of severe mitral stenosis in result was above 55.46% in our study which is high compared to other studies. The main reasons for this high frequency may be late diagnosis and poor rheumatic fever prophylaxis which can be attributed to the failure to diagnose and treat at the primary or secondary health centres. Most of the patients in our study were diagnosed for MS when they got admitted in hospital which may be attributed to the high number of diagnosis of MS as compared to other studies, which were mostly done in developed countries having better diagnostic facilities [10][11][12].

Selzer and Katayama in 1972 reported the first large series of 230 consecutive cases of isolated mitral regurgitation in which the majority of patients (92%) were evaluated with

cardiac catheterization[13]. They reported that 88 (39%) of the 230 patients had mitral regurgitation secondary to a rheumatic etiology. The identification of a rheumatic etiology was based on description of the valve on surgical inspection in 61 (69%) of the 88 patients and on a history of rheumatic fever in the remaining 27 patients (31%). Other investigators also report a very high incidence of pure mitral regurgitation in children in Mexico and India, where rheumatic fever remains a major health hazard [14][15].This finding is consistent with our study where 11.42 % patients had severe mitral regurgitation. This contrasts with studies by Waller et al.WHO reported their findings in 97 patients over 30 years of age undergoing mitral valve replacement for isolated severe mitral regurgitation [16]. Their analysis of the excised mitral valves included measured mitral valve area and annular circumference. In this series, mitral valve prolapse with or without ruptured chordae was considered the most common etiology, accounting for 60% of isolated severe mitral regurgitation requiring valve replacement. RHD was present in only 3% of patients. However, in their study population the prevalence of rheumatic fever and rheumatic heart disease were rare. This could be the possible explanation of such a low prevalence of mitral regurgitation.
Rheumatic AS due to fusion of the commissures with scarring and eventual calcification of the cusps is less common and is invariably accompanied by MV disease. In our study the severe aortic stenosis was associated with aortic regurgitation and mitral stenosis [17]. Rheumatic fever remains a common cause of primary disease of the aortic valve that leads to regurgitation.

The cusps become infiltrated with fibrous tissues and retract a process that prevents cusp apposition during diastole; this usually leads to regurgitation into the left ventricle through a defect in the centre of the valve. The associated fusion of the commissures may restrict the opening of the valve, resulting in combined AS and AR; some associated mitral valve involvement is also common [18].

In our study, many of the patients had an advanced stage of the disease. The reason can be by type of study and place as tertiary centre, where patient without primary health care facilities come directly with the disease in advanced stage.

Limitations of the study is only the female patients who were admitted with the symptoms of heart failure or elective PTMC or valve replacement or repair were analyzed. The data did not include outpatient female patients with asymptomatic severe vulvar involvement and mild to moderate degree of valvular lesion. This data cannot be extrapolated to general population of rheumatic valvular involvement.

6. Conclusion

A significant number of the female patients are admitted with rheumatic heart disease which is only the tip of iceberg. The mitral valve lesion is the most common lesion particularly mitral stenosis leads to significant comorbidities and premature death. There is a need for the intensive primary and secondary prophylaxis of acute rheumatic fever and rheumatic heart disease to prevent development of severe form of the disease.

7. Future Scope

This study was focused on female patients only, this can further be scaled with both male and female, and with different age groups and different demographic variability to assess the risk level with different variations.

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