

The Frequency of Severity (Mild, Moderate or Severe) of Mitral Valve Stenosis Diagnosed on 2d Echocardiography

YASIR IRSHAD¹, AJWAD FAROGH², SHAHID IRFAN³

ABSTRACT

Aim: To determine the frequency of severity (mild, moderate and severe) of mitral stenosis by using Two-dimensional (2D) Doppler echocardiography.

Methods: In this cross sectional study total 379 patients fulfilling the inclusion criteria was enrolled from outpatient department of Cardiology, Bahawal Victoria Hospital Bahawalpur from July 2013 to January 2014. Patients with diagnosis of mitral stenosis, both male and female, age between 20-50 years and patients with duration of symptoms of 1-12 months were included in this study. The severity (mild, moderate, severe) of the mitral stenosis was labeled as per findings of 2 D echocardiography (gold standard).

Results: Total 379 patients were included in this study according to inclusion criteria. Mean age of the patients was 35.5±8.63, mean duration of symptoms was 6.33±3.51. Male patients were 131(35%) and female patients were 248(65%). Among the patients of mitral valve stenosis, mild stenosis was found in 65(17%), moderate in 129(34%) and severe stenosis was found in 185(49%) patients.

Conclusion: Mitral valve stenosis is the most common findings in valvular heart diseases in hospital for echocardiography. Among which severe mitral valve stenosis is most of the time in younger ages females.

Keywords: Mitral Stenosis, mitral valve area, mitral leaflet separation, echocardiography

INTRODUCTION

Mitral stenosis (MS) is one of the most common valvular heart lesion, we come across in our daily clinical practice. Predominant cause of mitral stenosis is rheumatic fever¹ with rheumatic changes present in 99% of stenotic mitral valves excised at the time of mitral valve replacement. About 25% of all patients with rheumatic heart disease have isolated mitral stenosis, and about 40 percent have combined mitral stenosis and mitral regurgitation. Multivalve involvement is seen in 38% cases of MS patients with aortic valve affected in about 35% and tricuspid valve in about 6% the pulmonary valve is rarely affected². Rheumatic fever results in characteristic changes of mitral valve, diagnostic features are thickening at the leaflet edges, fusion of commissures, chordal shortening and fusion³.

Determining the severity of mitral stenosis (MS) is important for both prognostic and therapeutic reasons. Severity of mitral stenosis can be assessed clinically as well as with different investigations. Clinically the severity is assessed by unctat as

classified by NYHA classification, history of palpitation on exertion, cough and haemoptysis, frequent respiratory tract infections, poor growth, frequent admissions to hospital with pulmonary oedema, and previous thromboembolic phenomenon⁴. Two-dimensional (2D) Doppler echocardiography is presently regarded as the gold standard method for assessment of severity of MS⁵. The mitral valve area (MVA) can be measured by planimetry, pressure half-time, continuity equation, and proximal isovelocity surface area methods⁶. In a study by Shaikh AM et al, the frequency of severity of mitral stenosis (diagnosed on 2 D echo planimetry MVA cm was described as: mild (30.3%), moderate (42.4%) and severe (27.3%)⁷.

Direct measurement of MVA by planimetry is accurate but is highly operator dependent and sometimes laborious. The reliability of the pressure half-time method is affected by changes in preload or left ventricular compliance. The transmitral gradient is also well correlated with MS severity⁸.

The treatment of mitral stenosis depends upon the severity of disease. This will effect on therapeutic or prognostic values. This is essential to determine the frequency of severity, as majority of the patients present late in our country due to common quackery practice and ignorance of health in a developing countries like Pakistan. This will help us to planning and making its strategy to this particular treatment.

¹Post Graduate Trainee, Department of Cardiology, Bahawal Victoria Hospital, Bahawalpur

²Assistant Professor, Department of Cardiac Surgery, Quaid-e-Azam Medical College, Bahawalpur.

³Associate professor, Department of Medicine, Bahawal Victoria Hospital Bahawalpur

Correspondence to Dr. Yasir Irshad, E-mail: red.revolution1981@yahoo.com

MATERIALS AND METHODS

In this cross sectional study total 379 patients fulfilling the inclusion criteria were enrolled from outpatient department of Cardiology, Bahawal Victoria Hospital Bahawalpur from July 2013 to January 2014. Patients with diagnosis of mitral stenosis, both male and female, age between 20-50 years and patients with duration of symptoms of 1-12 months were included in this study. Permission was taken from institutional review committee. An informed written consent was taken from every patient. Patients with any prior surgical or interventional procedures for treatment of heart disease, patients with suboptimal images and/or heavy mitral valvular calcification precluding the accurate measurement of cuspal separation. Patients with duration of symptoms less than one month and those with more than one year, hemodynamically unstable patients and patients with systolic blood pressure <90mm of Hg was excluded from the study.

The Demographic data and detailed history was taken. Previous medical record was checked. The severity (mild, moderate, severe) of the mitral stenosis was labeled as per findings of 2 D echocardiography (gold standard). Severe mitral stenosis would be defined as MVA of 1cm² or less by planimetry or pressure half-time, Moderate mitral stenosis would be defined as MVA between 1cm² and 1.5cm² by planimetry or pressure half-time method and Mild Mitral Stenosis would be defined as an MVA of more than 1.5cm² by planimetry or pressure half-time. All information was entered on Performa.

Data was entered and analyzed using SPSS version 17.0. The quantitative variables were presented as mean and standard deviation. The qualitative variables were presented as frequencies. Effect modifiers was controlled through stratification of age, gender and duration of symptoms to see the effect of these on outcome variables i.e., mild, moderate and severe. Post stratification applying chi square test taken P-value ≤ 0.05 as significant.

RESULTS

Total 379 patients were included in this study according to inclusion criteria. Mean age of the patients was 35.5±8.63 years, mean duration of symptoms was 6.33±3.51 months. Among the patients of mitral valve stenosis, mild stenosis was found in 65(17%), moderate in 129(34%) and sever stenosis was found in 185 (49%) patients (Fig. 1).

After age wise stratification of the patients, out of 197(52%) patients of age group of 20-35 years of age, the values for mild, moderate and sever mitral

valve stenosis was 22(11%), 60(31%) and 115(58%) respectively. In age group of 36-50 years, there were 182 (48%) patients with mitral valve stenosis, in which values for mild stenosis was 43(23.6%), moderate stenosis 69(37.9%) and sever stenosis 70(38.5%) (Table 1).

After gender stratification, total 131(34.6%) male patients were suffering with mitral valve stenosis and mild stenosis was found in 32(24.4%) males, moderate stenosis in 26(19.8%) males and sever stenosis was found in 73(55.7%) males. Total 248(65.4%) female patients were suffering with mitral valve stenosis and value for mild, moderate and sever stenosis was 33(13.3%), 103(41.5%) and 112(45.2%) respectively (Table 2).

As shown in Table 3 after stratification of duration of symptoms, total 208(55%) was present with 1-6 months of symptoms. Mild stenosis was found in 37(17.8%) patients, moderate stenosis was found in 69(33.1%) patients and sever stenosis was found in 102(49%) patients. With 7-12 months of symptom of mitral valve stenosis there were 171(45%) patients. Out of which mild stenosis was found in 28(16.4%) patients, moderate stenosis in 60(35%) patients and sever stenosis found in 83 (48.5%) patients.

Fig. 1: Severity of mitral stenosis

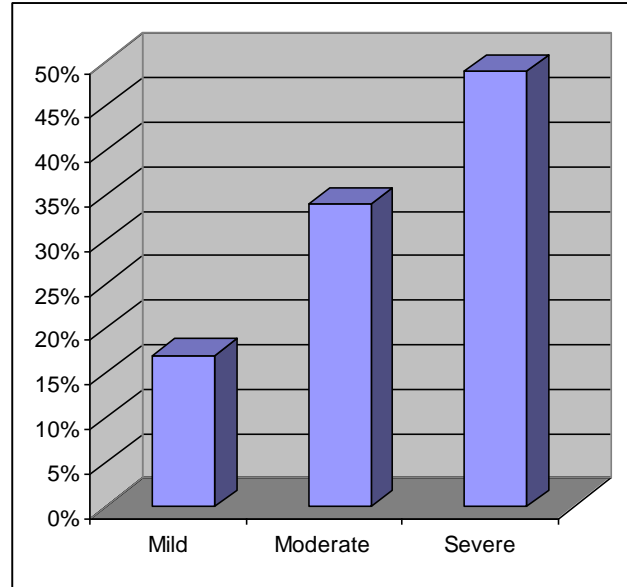


Table 1: Stratification for age

Age group (Yrs)	Stenosis			Total
	Mild	Moderate	Severe	
20-35	22(11%)	60(31%)	115(58%)	197(52%)
36-50	43(23.6%)	69(37.9%)	70(38.5%)	182(48%)
Total	65(17%)	129(34%)	185(49%)	379

P value 0.000

Table 2: Stratification for gender

Gender	Stenosis			Total
	Mild	Moderate	Severe	
Male	32(24.4%)	26(19.8%)	73(55.7%)	131(34.6%)
Female	33(13.3%)	103(41.5%)	112(45.2%)	248(65.4%)
Total	65(17%)	129(34%)	185(49%)	379

P value 0.000

Table 3: Stratification for symptoms

Duration of symptoms	Stenosis			Total
	Mild	Moderate	Severe	
1-6 Months	37(17.8%)	69(33.1%)	102(49%)	208(55%)
7-12 Months	28(16.4%)	60(35%)	83(48.5%)	171(45%)
Total	65(17%)	129(34%)	185(49%)	379

P value 0.89

DISCUSSION

Echocardiography plays a major role in decision-making for mitral stenosis, allowing for confirmation of diagnosis, quantitation of stenosis severity and its consequences, and analysis of valve anatomy⁹.

Mitral stenosis is the most frequent valvular complication of rheumatic fever. Even in industrialized countries, most cases remain of rheumatic origin as other causes are rare. Given the decrease in the prevalence of rheumatic heart diseases, MS has become the least frequent single left-sided valve disease. However, it still accounts for 10% of left-sided valve diseases in Europe. But mitral stenosis is the most common finding in echocardiography in developing countries as a consequence of rheumatic fever which is endemic here¹⁰.

In the present study 379 cases of mitral stenosis in adults in the age range of 20-50 years were studied and an attempt has been made for the clinical evaluation with non-invasive investigation like 2-D echocardiography in patients with mitral stenosis.

As shown in Figure 2 mild, moderate and severe mitral stenosis was found 65(17%), 129(34%) and 185(49%) respectively. In one study of Sheikh MA et al⁹ showing mild stenosis 30.3%, moderate stenosis 42.4% and severe stenosis 27.3%, values found higher with my study. In one study of Faheem M et al¹⁰ mild stenosis was found in 37.6% patients and moderate stenosis was found in 37.9% patients and severe stenosis was present in 24.5% patients.

In another study at Karachi by Zahed S et al¹¹ showed that 19(27.1%) patients had mild mitral stenosis, 33(47.1%) moderate and severe in 18(25.1%) patients. Mitral stenosis is one of the most common acquired valvular heart disease in Pakistan. It affects all age groups. The definitive treatment is relief of obstruction by surgery or balloon valvuloplasty. The main important characters which determine the operability and the type of surgery are

the severity of mitral stenosis and morphology of the stenosed valve^{12,13}.

In my study mitral stenosis was found in 52% in Adult age group and 48% in older age group. According to Aurakzai HA et al¹⁴ Majority of the male patients with moderate and severe mitral stenosis were seen in the older age group. Majority of the female patients with moderate and severe mitral stenosis were seen in the younger age group.

Females are found more effected by Mitral valve stenosis as compare to male in our study, here 65% females mitrally stenosed. It is similar to other studies of our regions like study of Hyderabad by Sheikh et al¹⁵ where 65.4% female are affected by mitral stenosis.

In one study by Sleh HK et al¹⁶ echocardiography scanning was performed in all patients. After scanning, mitral stenosis was found in 48.3% patients and 52.1% female patients and severity of stenosis was 4.1% mild, 9.5% moderate and 18.8% severe. In my study the severity of mitral valve stenosis in male patients was 24.4%, 19.8% and 55.7% mild, moderate and severe respectively, in female severity of mitral stenosis (mild, moderate and severe) was 13.3%, 41.5% and 45.2%, these results was in contrast with the findings of Aurakzai HA et al¹⁷.

CONCLUSION

Mitral valve stenosis is the most common findings in valvular heart diseases in hospital for echocardiography. Among which severe mitral valve stenosis is the most of the time in younger ages females.

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