

Clinical Profile of Patients with Mitral Stenosis in Nangarhar University Teaching Hospital

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ABSTRACT

Background: Mitral valve stenosis is strongly associated with rheumatic heart disease. Patients with mitral stenosis may have better prognoses if they receive the right care. Thus, the purpose of this study was to characterize the characteristics of patients with mitral stenosis in the Nangarhar University Teaching Hospital's respiratory and valvular heart disease ward. An earlier detection of mitral stenosis can be expected. This enables the quick administration of the proper medicine and the avoidance of subsequent complications.

Materials and Methods: The inpatient medical records of patients diagnosed with mitral stenosis from echocardiography in the respiratory and valvular heart disease ward of the Nangarhar University Teaching Hospital between June 2021 and March 2022 were used for this descriptive retrospective study, which used a cross-sectional approach and accidental sampling method. The variables included the patients' age, gender, degree of illness, and place of residence. SPSS version 16 and Microsoft Excel were used to process the data.

Findings: According to the inclusion criteria, sixty-two patients were included in this study. Next, the patients were divided into groups based on their age, gender, disease severity, and location. According to the study's findings, the majority of participants were between the ages of 50 and 59 (51.6%), females predominated (67%), the majority of patients had serious illnesses (51.6%), and the majority of patients were from the province of Nangarhar (46.3%).

Conclusion: The bulk of patients with severe mitral stenosis were female, in their productive years. Medication is not available to treat mitral valve stenosis. As a result, the physicians might recommend medicine to treat your problems. If a cardiologist concludes that a mitral valve replacement or repair is necessary, both surgical and nonsurgical alternatives may be taken into consideration.

Keywords: Echocardiography, Mitral stenosis, Valvular heart disease, Severity

INTRODUCTION

A cardiac valve anomaly known as mitral stenosis narrows the mitral valve orifice during the valve's opening motion, reducing blood flow from the left atrium to the ventricle (Harb and Griffin, 2017). Mitral valve stenosis is a structural defect of the mitral valve that causes a restriction to the left ventricle's inward flow. According to El-Dosouky and Meshrif (2016), the most frequent cause of mitral valve stenosis is rheumatic fever. The third or fourth decade of life is when mitral stenosis symptoms typically appear, and over half of the patients do not remember ever having an acute rheumatic fever. Complications will arise if the problem persists. Pulmonary hypertension, atrial fibrillation, heart failure, and stroke are the most frequent complications (Irshad

et al., 2009). Mitral stenosis or regurgitation affects about 40% of individuals with rheumatic heart disease (Wunderlich et al., 2019).

The mitral valve narrows in people with mitral valve stenosis, which reduces or, in extreme situations, completely blocks blood flow to the left ventricle, the heart's primary pumping chamber. As a result, the heart must pump blood through the body more forcefully, increasing the risk of heart failure (Chandrashekhara et al., 2009). One of the four main heart valves is the mitral valve. The way that blood flows through the valves and into the heart's chambers is managed by these cardiac valves to ensure the best possible pumping action. Blood and pressure build up when your mitral valve isn't working properly, which causes the left atrium to expand and fluid to enter your lungs (Kee and Naughton, 2010).

Over time, mitral valve stenosis advances gradually. For years, the patient might not experience any symptoms. A child's symptoms might appear at any age. According to Syvolap et al. (2017), these symptoms can include dyspnea, exhaustion, swollen ankles and feet, heart palpitations, fainting or vertigo, blood in the cough, chest pain, irregular heart rhythm, and heart murmur. Rheumatic fever is the most frequent cause of mitral stenosis. According to Gupta (2009), congenital cardiac abnormalities, radiation therapy to the chest, aging (calcium deposits accumulate on the valve with time), and autoimmune disorders like lupus are other causes of mitral stenosis.

In developed nations like the United States and the United Kingdom, the incidence of mitral stenosis is relatively low. However, this is in contrast to developing nations like Asia, Africa, and the Pacific Islands, where rheumatic fever is still a common disease (Moloi et al., 2017). Significant morbidity and mortality result from mitral stenosis (Andell et al., 2017). Thus, it is anticipated that early identification and fast treatment of mitral stenosis will lower the incidence and death rate from cardiovascular disease. In order to identify mitral stenosis early and stop further complications, this study was carried out to characterize the profile of patients with mitral stenosis in the inpatient ward of respiratory and valvular heart diseases of the Nangarhar University Teaching Hospital from June 2021 to March 2022.

MATERIALS AND METHODS

From June 2021 to March 2022, the respiratory and valvular heart diseases ward of Nangarhar University Teaching Hospital's inpatient medical records of patients diagnosed with mitral stenosis from echocardiography were the basis for this study's descriptive retrospective with cross-sectional approach and accidental sampling method. The selection of the inpatient medical record was based on the data it provided from the echocardiographic examination. Age, gender, disease severity, and patient locations were the factors that were used. The study excluded patients with incomplete medical data, patients who had undergone double valve replacement surgery, and patients who had an irregular aortic valve. The data that was gathered was processed using SPSS version 16 and Microsoft Excel.

The severity of the disease is divided into three categories: mild, moderate, and severe. Mild disease occurs when the mitral valve orifice area is greater than 1.5 cm², pulmonary arterial pressure is less than 30 mmHg, and the transmission gradient is less than 5 mmHg. Severe disease occurs when the mitral valve orifice area is less than 1.5 cm², pulmonary arterial pressure is between 30 and 50 mmHg, and the transmission gradient is between 5 and 10 mmHg, as determined by echocardiography.

Inclusion Criteria

Patients who were logically adult diagnosed causes of mitral stenosis, belong to both gender were included to this study.

Exclusion Criteria

Aortic valve diseases, double valve replacement and incomplete medical records were excluded in this study.

RESULTS

Age and Sex Relation with Mitral Stenosis

This study obtained 62 samples who met the inclusion criteria. The age and sex characteristics are summarized in Table 1 and 2. The ages were differed from 20 – 59 years old with the most prevalent age range was productive at 50-59 years old which was 51.6% (Table 1). Mitral stenosis was found in both male and female genders. Most patients were female (67%); however, male patients were 32% (Table 2).

Table 1. Characteristic of mitral stenosis patient according to age.

Variables	Frequency	Percentage (%)
Age groups (years)		
20-29	9	14.5
30-39	10	16.1
40-49	11	17.7
50-59	32	51.6

Table 2. Characteristic of mitral stenosis patient according to sex.

Variables	Frequency	Percentage (%)
Gender		
Male	20	32
Female	42	67

The severity and residency characteristics of patients with mitral stenosis are summarized in Table 3 and 4. There were also 62 samples in the inclusion criteria. There were three severity categories in this study including mild, moderate and severe. Most prevalent disease severity was severe with 51.6% (Table 3). All the patients were from the four provinces including Nangarhar, Laghman, Kunar and Nuristan. Based on the residency, majority of the patients were from Nangarhar province with 40.3% (Table 4).

Table 3. Characteristic of mitral stenosis patient according to severity.

Variables	Frequency	Percentage (%)
Severity		
Mild	12	19.3
Moderate	18	29
Sever	32	51.6

Table 4. Characteristic of mitral stenosis patient according to residency.

Variables	Frequency	Percentage (%)
Residency		
Nangarhar	25	40.3
Laghman	14	22.5
Kunar	12	19.3
Nuristan	11	17.7

DISCUSSION

People around the age of 50 are most likely to have rheumatic mitral stenosis, and the condition is typically diagnosed years or even decades after the infection first occurs. This is due to the possibility that heart valve deterioration may take years or decades to manifest symptoms or show up on a physical examination (Butcher et al., 2011). According to this study, the majority of patients (51.6%) are in the 50–59 year old productive age group. The average age of the patients was 54.4+9 years, with the youngest being 20 years old and the oldest being 59 years old. This data is consistent with a study conducted in India that found that 28.1% of patients with mitral stenosis were between the ages of 40 and 65; the oldest patient was 60 years old, and the average age varied from 53 years old (Jolobe, 2009). The youngest patient was 17 years old. Patients with mitral stenosis in developing nations were found to be younger in age when compared to those in industrialized nations, according to a study that examined their ages. This finding emphasizes how common rheumatic fever is in this setting and how penicillin usage is low. According to Kingue et al. (2016), improper immunization and poor sanitation contributed to the spread of streptococcus infection.

Women are more likely than males to have mitral stenosis as an indication for surgery, which usually calls for replacement. Studies in the past have not taken into consideration how gender disparities in the etiology of surgical mitral valve disease have altered over time (Bolling et al., 2010). The study's findings indicated that 67% of the patients were female. This is comparable to a study conducted in Egypt that discovered the incidence of mitral stenosis in women was 2.5 times greater than in men (Koju et al., 2009). Research from affluent nations like Sweden also revealed that women (66.88%) made up the majority of patients with mitral stenosis, with a female to male ratio of 2:1 (Marijon et al., 2008). This outcome is caused by women's elevated levels of

estrogen following menstruation, which occupy CD4+ and CD8+ receptors and permanently damage the mitral valve (Negi et al., 2018). Furthermore, because of the rise in cardiac output and blood volume during the second trimester, pregnant women with mild mitral stenosis may have symptoms (Yildirim et al., 2015).

Mitral stenosis can be confirmed via echocardiography. The heartbeat is visualized by sound waves. Heart valve issues and regions with inadequate blood flow can be detected by the test. Additionally, it can be used to gauge how severe mitral valve stenosis is (Lee et al., 2018). According to this study, 51.6% of the patients had severe mitral stenosis. Similar findings from an Indian study that revealed individuals with severe mitral stenosis constituted the majority of the patient population were also reported (Raafat et al., 2018). This study, however, contradicts a study conducted in Pakistan that found that patients with moderately severe mitral stenosis accounted for the majority of cases which was 37.6% (Roychoudhury et al., 2018). In our study, 32% of the participants had significant mitral stenosis. Genetics, recurrent beta-hemolytic streptococcal infection, educational background, and per capita income are among the variables that influence the severity of mitral stenosis (Triki et al., 2016). Moreover, rheumatic fever tends to be a more severe cause of mitral stenosis and results in severe stenosis, whereas degenerative processes tend to induce milder cases of mitral stenosis (Koju et al., 2009). This is consistent with a study conducted in Africa, where the percentage of patients with mitral stenosis was 44.1%. The study also found that the proportion of mitral stenosis is higher than that of other valvular heart diseases (El-Dosouky and Meshrif, 2016).

CONCLUSION

Untreated mitral stenosis is a quite prevalent condition that has a substantial risk of morbidity and death. The majority of patients with mitral stenosis were of working age, and the majority of them were from the province of Nangarhar. Female patients with severe disease severity predominated. If there is no sign of left atrial appendage thrombus and the valve is flexible, percutaneous balloon mitral commissurotomy is advised as the initial course of treatment for mitral stenosis. Finally, if a cardiologist concludes that a mitral valve replacement or repair is necessary, both surgical and nonsurgical procedures may be taken into account.

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REFERENCES

- Harb, S. C., & Griffin, B. P. (2017). Mitral valve disease: a comprehensive review. *Current cardiology reports*, 19, 1-8.
- El-Dosouky, I. I., & Meshrif, A. M. (2016). Role of the mitral valve resistance in evaluation of mitral stenosis severity. *J Med Diagn Meth* 2016, 5(1).
- Irshad, Y., Farogh, A., & Irfan, S. The Frequency of Severity (Mild, Moderate or Severe) of Mitral Valve Stenosis Diagnosed on 2d Echocardiography.
- Wunderlich, N. C., Dalvi, B., Ho, S. Y., Kuex, H., & Siegel, R. J. (2019). Rheumatic mitral valve stenosis: diagnosis and treatment options. *Current cardiology reports*, 21, 1-13.
- Chandrashekhara, Y., Westaby, S., & Narula, J. (2009). Mitral stenosis. *The Lancet*, 374(9697), 1271-1283.
- Kee, K., & Naughton, M. T. (2010). Heart failure and the lung. *Circulation Journal*, 74(12), 2507-2516.

- Syvolap, V. V., Oleynik, A. I., Likhachenko, I. V., Avramenko, N. F., Gerasco, M. P., Kurylez, L. O., & Zhemanyuk, S. P. (2017). Symptoms and syndromes in diseases of internal organs: manual for the third-year students of the international faculty.
- Gupta, M. (2009). *Clinical And 2-D Echo Study Of Adult Mitral Stenosis* (Doctoral dissertation, Rajiv Gandhi University of Health Sciences (India)).
- Moloi, A. H., Mall, S., Engel, M. E., Stafford, R., Zhu, Z. W., Zühlke, L. J., & Watkins, D. A. (2017). The health systems barriers and facilitators for RhD prevalence: an epidemiological meta-analysis from Uganda and Tanzania. *Global Heart, 12*(1), 5-15.
- Andell, P., Li, X., Martinsson, A., Andersson, C., Stagmo, M., Zöller, B., ... & Smith, J. G. (2017). Epidemiology of valvular heart disease in a Swedish nationwide hospital-based register study. *Heart, 103*(21), 1696-1703.
- Butcher, J. T., Mahler, G. J., & Hockaday, L. A. (2011). Aortic valve disease and treatment: the need for naturally engineered solutions. *Advanced drug delivery reviews, 63*(4-5), 242-268.
- Jolobe, O. M. (2009). Can the gender imbalance in mitral stenosis prevalence be mitigated?. *The American Journal of Medicine, 122*(2), e7.
- Kingué, S., Ba, S. A., Balde, D., Diarra, M. B., Anzouan-Kacou, J. B., Anisubia, B., ... & Monsuez, J. J. (2016). The VALVAFRIC study: a registry of rheumatic heart disease in Western and Central Africa. *Archives of cardiovascular diseases, 109*(5), 321-329.
- Bolling, S. F., Li, S., O'Brien, S. M., Brennan, J. M., Prager, R. L., & Gammie, J. S. (2010). Predictors of mitral valve repair: clinical and surgeon factors. *The Annals of thoracic surgery, 90*(6), 1904-1912.
- Koju, R., Gurung, R., Pant, P., Pokharel, B., & Bedi, T. R. S. (2009). Pattern of heart valve involvement in rheumatic heart disease. *Nepalese Heart Journal, 6*(1), 17-22.
- Marijon, É., Iung, B., Mocumbi, A. O., Kamblock, J., Thanh, C. V., Gamra, H., ... & Vahanian, A. (2008). What are the differences in presentation of candidates for percutaneous mitral commissurotomy across the world and do they influence the results of the procedure?. *Archives of cardiovascular diseases, 101*(10), 611-617.
- Negi, P. C., Sondhi, S., Rana, V., Rathoure, S., Kumar, R., Kolte, N., ... & Asotra, S. (2018). Prevalence, risk determinants and consequences of atrial fibrillation in rheumatic heart disease: 6 years hospital based-Himachal Pradesh-Rheumatic Fever/Rheumatic Heart Disease (HP-RF/RHD) Registry. *Indian Heart Journal, 70*, S68-S73.
- Yıldırım, E., Çelik, M., & Akpak, Y. K. (2015). Mitral stenosis and pregnancy. *Open Science Journal of Clinical Medicine, 3*(6), 220-223.
- Lee, P. H., Hong, J. A., Sun, B. J., Han, S., Park, S., Jang, J. Y., ... & Song, J. M. (2018). Impact of significant mitral regurgitation on assessing the severity of aortic stenosis. *Journal of the American Society of Echocardiography, 31*(1), 26-33.
- Raafat, S. S., Ramzy, A. A., El-Hadidy, A. F., Abd Allah, M. A., & Hanna, H. F. (2018). Mitral leaflet separation index. An easy two dimensional echocardiography technique for assessment of mitral valve area before and after percutaneous balloon mitral valvuloplasty. *The Egyptian Heart Journal, 70*(3), 195-201.
- Roychoudhury, D., Nanda, N. C., Hon, J. J., Filsoufi, F., Salma, A. Y., & Akdogan, R. E. (2018). Rheumatic mitral and aortic valve disease-a case report from USA. *Cardiovascular Journal, 11*(1), 81-85.
- Triki, F., Abid, D., Jdidi, J., Tabbabi, M., Hentati, M., Abid, L., & Kammoun, S. (2016). Epidemiological characteristics, etiological spectrum and management of valvular heart disease: about 959 cases les caractéristiques épidémiologiques, étiologiques et thérapeutique des valvulopathies: A Propos De 959 Cas. *Journal de l'Information Médicale de Sfax, 34*.