# Clinical Presentation of Mitral Stenosis

## A Single Center Study

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## ABSTRACT

**Background:** Mitral stenosis is a valvular heart disease that is common in developing countries including Iraq.

**Objectives:** To evaluate the main presenting symptoms of mitral stenosis patients attending outpatient clinic of Ibn Al-Nafees hospital.

**Methods:** This study was retrospective cross sectional study conducted in outpatient clinic of Ibn Al-Nafees Hospital in Baghdad between 1st of March, 2014 to the 30th of June, 2016 on sample of 64 patients with mitral stenosis. The mitral stenosis was diagnosed by physicians specialist in internal medicine with help of ultrasonography and echocardiography.

**Results:** Mean ± SD age of mitral stenosis patients was 37.9 year with predominance of female gender (71.1%). The clinical presentation of mitral stenosis patients was asymptomatic in 6 (9.4%) patients or symptomatic with shortness of breath (65.6%), palpitations (54.7%), fatigability (46.9%), orthopenia (40.6%), chest pain (20.3%) and hemoptysis (15.6%).

**Conclusions:** Shortness of breath was the common clinical presentation of mitral stenosis with gender variation.


**Keywords: Clinical presentations, Shortness of breath, Mitral stenosis, Echocardiography.**

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Mitral stenosis (MS), which is classically related to rheumatic heart diseases (RHD), is defined as the narrowing of the mitral valve orifice and caused by improper diastolic filling of left ventricle. Rarely, MS can be caused by rheumatoid arthritis, congenital origin, or calcifications of mitral valve annulus[1]. The rheumatic heart diseases and mitral stenosis are not common in developed countries while the incidence of RHD and MS in developing countries have been increased in last years to become a major public health problem[2]. In Iraq, higher proportion of children and adolescent are diagnosed yearly with RHD and MS and mainly attributed to β hemolytic streptococcus infection[3]. MS prevalence is high in younger age children with severe complications, this needs early diagnosis and management[4].

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The common presenting clinical features of MS are shortness of breath, fatigue and palpitation with less common presenting symptoms of hemoptysis and thromboembolic or infective endocarditis complications[5]. The features of MS become obvious when mitral valve orifices decreased to less than 25% of normal opening. These MS clinical features are more prominent among females in middle age especially in developing countries while in endemic areas, presenting symptoms tend to be prevalent in younger age patients[6].

Differential diagnosis of MS is includes left atrial myxoma, mitral prosthetic valve and pulmonary vein occlusion. The chest x-ray and electrocardiography are helpful in diagnosis of MS, but definite diagnosis is acquired by cardiac ultrasound or cardiac catheterization[6]. MS symptoms could be treated medically but the surgery is treatment of choice specifically for patients with persistent MS symptoms. The surgical

choice includes either mitral commisurotomy or balloon valvuloplasty[5,6].

MS is frequently accompanied by complications like respiratory tract infections, atrial fibrillation, pulmonary hypertension, cerebrovascular accidents, pulmonary edema, right heart failure and others, which are the cause of high morbidity and mortality rates[7]. Endemic state of MS in Iraq and the lack of national guidelines for MS diagnosis in addition to scarcity of literatures discussing MS medical problem, all are the rational of present study that aimed to evaluate main presenting symptoms of MS patients attending to outpatient clinic of Ibn Al-Nafees hospital.

## Methods

This study is a retrospective cross-sectional study conducted in outpatient clinic of Ibn Al-Nafees Hospital in Baghdad between 1st of March, 2014 to the 30th of June, 2016. All patients with mitral stenosis (MS) admitted to the hospital were the study population. Inclusion criteria were; known cases of MS or newly diagnosed MS by ultrasonography with or without complications. MS patients with other rheumatic valvular heart diseases, non-rheumatic valvular heart diseases, systemic lupus erythematous and atherosclerosis were excluded from the study. A convenient sample of 64 patients with MS was selected after eligibility to inclusion and exclusion criteria. An approval for study was taken from the Ethical Committee of Al-Risafa Health Directorate and an informed consent was taken from each patient before enrollment in the study in addition to the researchers' responsibility for maintenance of patients' management accordingly.

MS patients were diagnosed by physicians specialist in internal medicine with help of ultrasonography and echocardiography. The researcher collected the data through direct interview of MS patients and filling a prepared questionnaire in addition to reviewing the recorded files of MS patients in the hospital (known cases). The presenting symptoms of patients and history of prophylaxis were detected through history taking from the MS patients or from their medical files. The chest x-ray and ECG findings were taken also from the recorded medical files.

The statistical analysis was conducted by using Statistical Package for Social Sciences (SPSS) version 23. Multiple contingency tables were performed.

## Results

Sixty-four patients with MS were included in the study with mean age of 37.9±14.5 years; 32.8% of them were in age group 30-39 years. Female MS patients were more than male MS patients with female to male ratio as 2.5:1. The occupation of studied MS patients was distributed as followings; housewife (68.7%), employed (23.5%), retired (6.2%) and student (1.6%), (Table 1).

The presenting symptoms of MS in present study were absent (asymptomatic) in 6 (9.4%) patients while symptomatic patients presented with shortness of breath (65.6%), palpitations (54.7%), fatigability (46.9%), orthopenia (40.6%), chest pain (20.3%) and hemoptysis (15.6%). The positive history of rheumatic fever prophylaxis was present among 25 (39.1%) MS patients, (Table 2).

Chest x-ray of studied MS patients showed normal findings in 7 (10.9%) patients, mitralization in 48 (75%) patients and increase cardiac shadow in 9 (14.1%) patients. The electrocardiography was normal among 39 (60.9%) MS patients, while the abnormal ECG findings were atrial fibrillation (18.8%), P-mitral (14.1%), atrial ectopie (3.1%) and right ventricular (RV) hypertrophy (3.1%), (Table 3).

A significant association was observed between asymptomatic MS and male gender patients ($p=0.005$). The shortness of breath and palpitations among MS patients were significantly more prevalent among female gender patients ($p<0.001$). No significant differences were observed

between male and female MS patients regarding fatigability, orthopenia and chest pain presenting symptoms. The hemoptysis was significantly associated with male gender MS patients, (Table 4).

**Table 1: Sociodemographic characteristics of the patients (n=64).**

| Variable | No. (%) |
|---|---|
| **Age** (mean ± SD=37.9 ± 14.5 years) | |
| < 20 years | 4 (6.2) |
| 20-29 years | 17 (26.6) |
| 30-39 years | 21 (32.8) |
| 40-49 years | 6 (9.4) |
| ≥ 50 years | 16 (25.0) |
| Total | 64 (100.0) |
| **Gender** | |
| Male | 18 (28.9) |
| Female | 46 (71.1) |
| Total | 64 (100.0) |
| **Occupation** | |
| Housewife | 44 (68.7) |
| Student | 1 (1.6) |
| Employed | 15 (23.5) |
| Retired | 4 (6.2) |
| Total | 64 (100.0) |

**Table 2: Clinical characteristics of the patients (n=64).**

| Variable | No. (%) |
|---|---|
| **Presenting symptoms** | |
| Asymptomatic | 6 (9.4) |
| Shortness of breath | 42 (65.6) |
| Palpitations | 35 (54.7) |
| Fatigability | 30 (46.9) |
| Orthopenia | 26 (40.6) |
| Chest pain | 13 (20.3) |
| Hemoptysis | 10 (15.6) |
| Total | 64 (100.0) |
| **History of rheumatic fever prophylaxis** | |
| Positive | 25 (39.1) |
| Negative | 39 (60.9) |

**Table 3: Investigations results of the patients (n=64).**

| Variable | No. (%) |
|---|---|
| **Chest x-ray** | |
| Normal | 7 (10.9) |
| Mitralization | 48 (75.0) |
| Increase cardiac shadow | 9 (14.1) |
| Total | 64 (100.0) |
| **Electrocardiography** | |
| Normal | 39 (60.9) |
| Atrial fibrillation | 12 (18.8) |
| P-mitral | 9 (14.1) |
| Atrial ectopic | 2 (3.1) |
| RV hypertrophy | 2 (3.1) |
| Total | 64 (100.0) |

**Table 4: Distribution of patients presenting symptoms according to gender (n=64).**

| Variable | Male | Female | P |
|---|---|---|---|
| | No. (%) | No. (%) | |
| **Asymptomatic** | | | **0.005*** S |
| Yes | 5 (27.8) | 1 (2.2) | |
| No | 13 (72.2) | 45 (97.8) | |
| **Shortness of breath** | | | **<0.001*** S |
| Yes | 3 (16.7) | 39 (84.8) | |
| No | 15 (83.3) | 7 (15.2) | |
| **Palpitations** | | | **<0.001*** S |
| Yes | 3 (16.7) | 32 (69.5) | |
| No | 15 (83.3) | 14 (30.5) | |
| **Fatigability** | | | 0.1** NS |
| Yes | 6 (33.3) | 24 (52.2) | |
| No | 12 (66.7) | 22 (47.8) | |
| **Orthopenia** | | | 0.6** NS |
| Yes | 8 (44.4) | 18 (39.1) | |
| No | 10 (55.6) | 28 (60.9) | |
| **Chest pain** | | | 0.6* NS |
| Yes | 3 (16.7) | 10 (21.7) | |
| No | 15 (83.3) | 36 (78.3) | |
| **Hemoptysis** | | | **<0.001*** S |
| Yes | 10 (55.6) | 0 (-) | |
| No | 8 (44.4) | 46 (100.0) | |

* Fishers exact test, ** Chi-square test, S=Significant, NS=Not significant.

## Discussion

Diagnosis of mitral stenosis needs full knowledge in natural history and clinical presentation of the disease with excellent interpretation of investigations findings. Normally, size of mitral of mitral valve usually ranges between 4-6 $cm^2$, with mild stenosis, it becomes 2 $cm^2$, with moderate stenosis, it ranges between 2-1 $cm^2$, while in severe stenosis, it is reduced to 1 $cm^2$ [8].

In present study, mean age of MS patients was 37.9 years with predominance of female gender (2.5:1). These findings are consistent with results of previous Iraqi study[9]. High proportions of MS patients were housewives, which is due to prevalent female gender in this study and cultural reasons of Iraqi community.

The present study showed that the common presenting symptom was shortness of breath (65.6%). The shortness of breath or known as dyspnea is subjective feeling by patients as difficult respiration. Coccia et al[10] reported that mitral stenosis is one of etiological factors for dyspnea. Other presenting symptoms in current study were palpitations, fatigability, orthopenia, chest pain and hemoptysis. This clinical presentation in the present study is similar to results of Khan et al[11] study which revealed that all MS patients presented with dyspnea, accompanied by other symptoms. Previous study conducted by Kotokey et al[12] stated that in elderly age MS patients, clinical presentation of MS patients was by exertional dyspnea, palpitation and orthopnea. In the present study, 39.1% of MS patients had rheumatic fever prophylaxis. Branco et al[13] stated that in recent days, the rheumatic fever is a neglected disease all over world with poor awareness in prevention guidelines.

The chest x-ray was abnormal in 89.1% of MS patients while ECG was abnormal in only 39.1% of MS patients. Previous American study reported that chest x-ray and ECG are suggestive for mitral stenosis but not diagnostic[14]. However, MS patients in the present study were diagnosed by ultrasound imaging and echocardiography.

The shortness of breath and palpitations among MS patients in current study were significantly more prevalent among female gender patients while asymptomatic and hemoptysis presentations were significantly more common among male MS patients. These findings are in agreement with results of many literatures like Dawood et al study[3] who reported gender differences in MS clinical presentation and Redberg et al[15] study which proved gender difference in MS pathophysiology and clinical presentation. Recent study by Divanovic[16] stated that pregnant women with MS were commonly presented with aggressive clinical presentation and also complicated with heart failure and adverse fetal outcomes. The main limitations of the present study were inability of patients to exactly remembering the presenting symptoms and/or missing recorded medical files and single center study that its results cannot be generalized nationally.

In conclusions, the present study documented that main clinical presentation of MS was the shortness of breath, followed by palpitations, fatigability, orthopenia, chest pain and hemoptysis with gender variations. Development of national diagnostic guidelines for MS with more studies on evaluation of diagnostic criteria for MS should be encouraged.

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**Conflict of interest**: None.

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