

## ORIGINAL ARTICLE

# Frequency of Acute Mitral Regurgitation in Post Percutaneous Transvenous Mitral Commissurotomy (PTMC) Patients with Severe Mitral Stenosis (MS)

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## ABSTRACT

**Objective:** The goal of this study is to see how often Acute Mitral Regurgitation is in patients with severe mitral stenosis who have undergone a percutaneous transvenous mitral commissurotomy (PTMC).

**Study Design:** Cross-sectional study

**Pace and Duration:** The study was carried out at cardiology department of Lady Reading Hospital MTI, Peshawar and PIMS hospital, Islamabad for the duration of six months from 16<sup>th</sup> August 2021 to 15<sup>th</sup> February 2021.

**Methods:** A total of 85 patients of both genders that underwent percutaneous transvenous mitral commissurotomy (PTMC) were included in this study. A detailed demographic profile of recruited patients including age, gender and body mass index (BMI) was compiled after obtaining informed written permission from each patient. A technician with over 10 years of experience examined pre- and post-procedure mitral regurgitation using a transthoracic echocardiography (TTE). Frequency of complication was also recorded. SPSS 21.0 was used to analyze all data.

**Results:** Among 85 patients, there were 65 (76.5%) females and 20 (23.5%) males. Mean age of the patients was 39.8 ±9.54 years and mean BMI 24.6±11.42 kg/m<sup>2</sup>. Previous commissurotomy was found in 9 (10.5%) cases. Pre-operative mean balloon size 26.5±1.88 and mitral valve area was 1.1±0.32. Frequency of severe mitral regurgitation found in 15 (17.6%) cases. 75 (88.2%) patients had no previous history of commissurotomy and the majority were females. Among 9 cases of severe MR, 4 (44.4%) had no previous history of commissurotomy.

**Conclusion:** According to our study, few PTMC patients had significant mitral regurgitation. Procedure is safe and effective. A multiethnic, multicenter, multicity research is proposed in Pakistan to evaluate genetic, environmental, and hospital-related variables associated with post-procedural problems in patients with severe mitral regurgitation who received PTMC.

**Keywords:** PTMC, Mitral Regurgitation, Post Percutaneous Transvenous Mitral Commissurotomy, Local Site complications, MR, Cardiac Tamponade

## INTRODUCTION

Acute rheumatic fever (ARF) is caused by the body's immunological reaction to a group A Streptococcus throat infection. Rheumatic heart disease (RHD) refers to the long-term cardiac damage produced by either a single severe episode of ARF or several recurring episodes. RHD is a major cause of illness and mortality across the world, particularly in areas with limited access to resources[1]. In the year 2015, there were 33.4 million instances of RHD and 10.5 million disability-adjusted life years owing to RHD worldwide. Pakistan is a high risk nation for RF and RHD[2]. The lack of education, poverty, overcrowding, and a lack of health services are all contributory factors[3]. When it comes to RHD, the most common complication is mitral regurgitation [4]. Over the years, we've witnessed an increase in the prevalence of mitral stenosis (MS) among youngsters, ranging from 5 to 12 years old.

When rheumatic fever is still prevalent, mitral stenosis (MS) is infrequently encountered in children and adolescents, particularly in underdeveloped nations where up to 25% of patients are younger than 20 years of age [5]. The medical term for this condition is juvenile mitral stenosis (JMS). Surgery, in the form of a closed or open commissurotomy, was the sole option available until the mid-1980s. Additionally, mitral valve surgery in children and teenagers has an additional disadvantage: the need for a reintervention 10 to 15 years down the road. [6] PTMC (percutaneous transvenous mitral commissurotomy) had similar [7] and better [8] outcomes in adults than open commissurotomy. [8] When mitral valves are flexible and calcified minimally, PTMC is a viable choice.

Although PTMC has a similar initial success rate to surgical commissurotomy procedures, the long-term outcomes and suitable patient selection for this operation remain controversial [9]. The semi-quantitative Wilkins score is the most often used echocardiographic criterion for morphological characteristics

[10]. Many randomised studies have demonstrated that other factors may be just as relevant in predicting the long-term occurrence of unfavourable clinical outcomes. However, because to variances in research design, the criteria and procedures utilised, and the period of follow-up, the success rate and the claimed prognostic variables have not always been the same.[11-13] There are the same concerns about mitral valve restenosis, which is predicted at some time in the course of follow-up because of the underlying rheumatoid disease. However, it has been established that the onset and incidence rates are influenced by a variety of factors [14, 15].

To address the lack of research in developing nations on the frequency of acute mitral regurgitation in patients who have had the Percutaneous Transvenous Mitral Commissurotomy operation for severe mitral stenosis, the present study was undertaken. Patients who had undergone the Post Percutaneous Transvenous Mitral Commissurotomy due to severe mitral stenosis were the major focus of this investigation.

## MATERIAL AND METHODS

This cross-sectional study was conducted at cardiology department of Lady Reading Hospital MTI, Peshawar and PIMS Hospital, Islamabad for the duration of six months from 16<sup>th</sup> August 2021 to 15<sup>th</sup> February 2021 and it was consisted of 85 patients. A detailed demographic profile of recruited patients including age, gender and body mass index (BMI) was compiled after obtaining informed written permission from each patient. All patients with mitral regurgitation and mitral stenosis, as well as those who had left atrial clots or those who were in the last stages of kidney disease, were excluded from this research.

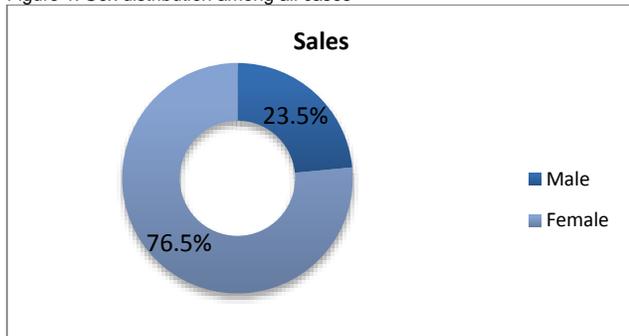
Eligible participants were those who had been diagnosed with Diabetes Mellitus or hypertension within the past year; those who had not undergone PTMC; and those who had not been

diagnosed with Diabetes Mellitus or hypertension within the last year. The age, gender, and results of an echocardiogram; the therapy itself; and any issues that may occur during or following the operation; before and after the surgery, the transthoracic echocardiograms (TTE) of the patient were examined by a TTE technician with over ten years of expertise. The data was analysed using IBM SPSS (statistical package for social sciences software) version 21. The mean and standard deviation were used to show all continuous data, including age, height, weight, and BMI. Data on gender, age groups, past commissurotomy, and so on were reported as frequencies and percentages.

**RESULTS**

Among 85 patients, there were 65 (76.5%) females and 20 (23.5%) were males.(figure 1)

Figure 1: Sex distribution among all cases



Mean age of the patients was 39.8 ±9.54 years and had mean BMI 24.6±11.42 kg/m<sup>2</sup>. Mean weight of the patients was 65.5±23.44 kg. Previous commissurotomy was found in 9 (10.5%) cases. Pre-operative mean balloon size 26.5±1.88 and mitral valve area was 1.1±0.32. Mean pressure gradients was 13.5±3.17.(table 1)

Table 1: Baseline details of enrolled cases

Variables	Frequency	Percentage
Mean age (years)	39.8 ±9.54	
Mean BMI (kg/m <sup>2</sup> )	24.6±11.42	
Mean Weight (kg)	65.5±23.44	
History of commissurotomy		
Yes	9	10.5
No	76	89.5
Balloon size	26.5±1.88	
Mitral valve area	1.1±0.32	
Mean pressure gradients	13.5±3.17	

Table 2: Post-operative complications and frequency of Acute MR

Variables	Frequency	Percentage
Acute MR		
Yes	15	17.6
No	70	82.4
Complications		
local hematoma	3	3.5
cardiac tamponade	2	2.4
mortality	1	1.2

Table 3: History of commissurotomy and complications among cases

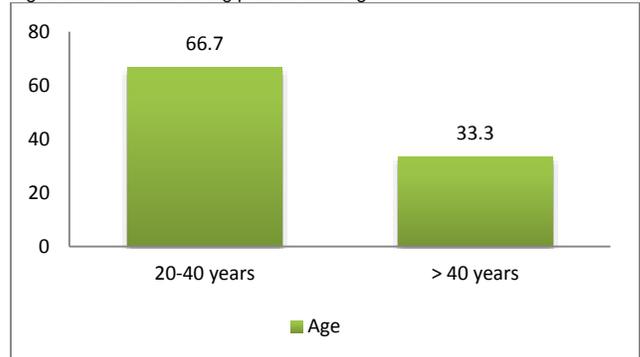
Variables	Frequency	Percentage
Commissurotomy History		
Yes	10	11.8
No	75	88.2
Gender		
Male	60	80
Female	15	20
Commissurotomy History among Acute MR Patients		
Yes	5	55.6
No	4	44.4

Frequency of severe mitral regurgitation found in 15 (17.6%) cases, local hematoma in 3 (3.5%) cases, cardiac tamponade in 2 (2.4%) cases and mortality found in 1 (1.2%) cases.(Table 2)

Post-operative we found that, 75 (88.2%) patients had no previous history of commissurotomy or complications and majority was females. Among 9 cases of severe MR, 4 (44.4%) had no previous history of commissurotomy. (table 3)

Among 9 cases of severe MR, majority of the patients 6 (66.7%) were aged between 20-40 years and the rest were 3 (33.3%) had age > 40 years.(figure 2)

Figure 2: Acute MR among patients with age



**DISCUSSION**

Mitral stenosis can be treated with PTMC. Most lesions in MS patients (those in their fifth to sixth decade) are diagnosed as opposed to those in patients with MR (or aortic regurgitation of rheumatic origin) because of their "smouldering" sub-clinical history. [16] A more severe rheumatic damage or recurrent bouts of carditis caused by streptococcal infections may be to blame for MS's fast progression in poorer nations. This leads in a worse prognosis for those with MS in their teens and early twenties. [17] Patients show significant pulmonary oedema, early pulmonary hypertension, and finally catastrophic right ventricular failure in the course of the disease progression. [18]

In this cross sectional stud 85 patients of both genders were presented. Among 85 patients, there were 65 (76.5%) females and 20 (23.5%) were males. Mean age of the patients was 39.8 ±9.54 years and had mean BMI 24.6±11.42 kg/m<sup>2</sup>. Previous commissurotomy was found in 9 (10.5%) cases. Pre-operative mean balloon size 26.5±1.88 and mitral valve area was 1.1±0.32. Results of our study was ompairable to the previous studies.[19,20] A small percentage of patients experienced complications, however the most prevalent was mitral regurgitation. Local site hematoma, cardiac tamponade, and mortality were all reported in the trial. Other risks included The study also found that men were more likely than women to experience'severe MR' following the operation. Severe mitral regurgitation was more prevalent in the elderly following the surgery, suggesting a link between severe age groups and severe mitral regurgitation (Severe MR). The new study's findings are in line with previous research. [21,22]

PTMC was shown to be a safe operation in a research conducted by Kothari et al., however patients with severe mitral stenosis were more likely than the control group to experience restenosis after the surgery. [23] A survival rate of 71% over the course of 20 years was reported by Kubota et al. for PTMC. Individuals with poor short-term results following PTMC should be closely monitored since they have a lower survival probability than those who have a better short-term response to surgery. [24] Another research by Bhardwaj et al. assessed the quality of life of MS patients pre- and post-PTMC. Aside from the fact that PTMC was a safe and successful surgery, it also greatly improved patients' quality of life (QOL), demonstrating the necessity of

providing this treatment option to patients at an early stage of their condition. [25]

Frequency of severe mitral regurgitation found in 15 (17.6%) cases. Previous study presented same results to our study.[16] Patients with severe mitral stenosis who have undergone the PTMC operation have a high success rate, according to the present research and earlier studies. [26] The risk of mitral regurgitation following surgery may be raised when the mean valvular area and the mitral valve mean gradient pressure are maintained. [27] No problems like localised hematoma or mitral regurgitation or circulatory compromise have been detected by the authors of a local trial done in 2019 at the Combined Military Hospital in Pakistan. Patients (mean age: 40.3 ± 2.8 years) who had PTMC had a high percentage of success. [28]

## CONCLUSION

According to our study, few PTMC patients had significant mitral regurgitation. Procedure is safe and effective. A multiethnic, multicenter, multicity research is proposed in Pakistan to evaluate genetic, environmental, and hospital-related variables associated to post-procedural problems in patients with severe mitral regurgitation who received PTMC.

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