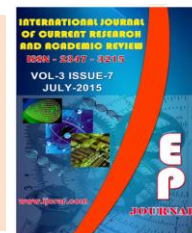




International Journal of Current Research and Academic Review

ISSN: 2347-3215 Volume 3 Number 7 (July-2015) pp. 387-393

www.ijcrar.com



Comparison between the level of pulmonary arterial pressure decline in men and women after PTMC

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KEYWORDS

MS,
PAP,
PTMC

A B S T R A C T

Mitral stenosis (MS) unlike mitral regurgitation (MR) more frequent in female patients than male patients. Most common cause of MS was rheumatic fever and rarely congenital that occurs in the fourth decade of life. The aim of this study was Comparison between the level of pulmonary arterial pressure decline in men and women after percutaneous transluminal mitral commissurotomy. In a cross-sectional and descriptive-analytical study that performed in Cardiology department of Tabriz University of Medical Sciences on patients with MS, reduction of pulmonary artery pressure (PAP) in male and female patient with MS at after percutaneous transluminal mitral commissurotomy (PTMC) evaluated. From 98 studied patients, 37(37.8%) of them was male and 61(62.2%) of them was female. Mean age of patients was 45.81 ± 13.72 at the range of 20-93 years. Heart rhythm of patients was sinus rhythm in 54(55.1%) and in 44(44.9%) patients was AF. Significantly differences was not found in mean of PAP at before PTMC ($P=0.496$), immediately after PTMC ($P=0.826$) and 6 month later PTMC ($P=0.893$). Mean PAP of patients at before PTMC was 46.94 ± 15.56 , immediately after PTMC was 35.20 ± 7.44 and 6 month later PTMC was 31.1 ± 3.3 . Mean PAP of patient immediately after PTMC was significantly lower than mean of PAP at before of PTMC ($P<0.001$). Mean PAP of patient 6 month after PTMC was significantly lower than mean of PAP at before of PTMC ($P<0.001$). Mean PAP of patient 6 month after PTMC was significantly lower than mean of PAP at immediately after PTMC ($P<0.001$). Significantly decrease was found between mean PAP of patients at after PTMC due to before PTMC ($P<0.001$).

Introduction

Unlike Mitral Regurgitation (MR), Multiple Sclerosis (MS) is more prevalent among females. The most common cause of MS is

rheumatic fever. MS is a rarely congenital disease with its onset in the fourth decade of life. Valve cusps are widely thickened by

fibrosis, calcific deposits or both while mitral valve commissures connect and create short tendinous cords that sometimes stick together. These factors lead to aortic valve stenosis and sometimes aortic regurgitation. Aortic valve stenosis causes an increase in the gradient between the left ventricle and atrium as well as an increase in pulmonary venous pressure. As a result, the level of pulmonary artery pressure (PAP) increases in the right end diastolic volume (EDV). It is characterized by dyspnea, pulmonary edema, and fatigue. It is more prevalent among females than males (1). In the case of the present study was taken for the comparison levels of pulmonary artery pressure in female and male samples before PTMC (percutaneous transvenous mitral commissurotomy) revealed some of the aforementioned symptoms.

Materials and Methods

In a cross-sectional descriptive-analytic study on MS patients visiting the cardiology department of Tabriz Medical Sciences University, the post-PTMC decline in pulmonary artery pressure was studied in MS female and male patients.

In this study, samples were selected from hospitalized patients with MS and the required information (including demographic information, clinical findings, and echocardiography data) was gathered and recorded. Afterwards, PTMC was applied to the participants (patients) and necessary information was recorded before and after PTMC. A one-week follow up program was also launched for the patients under study. The levels of PAP (pulmonary artery pressure) was measured and recorded 6 months after PTMC through echocardiography. It was not possible to measure PAP in 20 patients due to mechanical problems and thus those patients were excluded from the research.

The resulting data was statistically analyzed and results were expressed in terms of frequency, mean and standard deviation for male and female patients before and after PTMC.

Ethical Considerations

PTMC was performed in the course of diagnosis and no extra expense was imposed on the patients. Moreover, patients were ensured that their participation was voluntarily and none of their information was going to be published. In this study, patients experienced no intervention by the researcher. Hence, this research imposed no extra financial or work load on the patients.

Statistical Analysis

The collected data were analyzed by SPSS-17 statistical software. The collected data were expressed as percentage and mean \pm SD. Continuous (quantitative) variables were compared by Independent samples and Paired t test. Categorical (qualitative) variables were compared by contingency tables and Chi-square test or Fisher's exact test. P-value ≤ 0.05 was considered statistically significant.

Result and Discussion

In this research, the levels of PAP were measured in MS patients before and after application of PTMC. The following results were obtained:

Of the 98 patients under study, 37 patients (37.8%) were male and 61 (62.2%) were female. The mean age of participants was 45.81 ± 13.72 years and the ages varied from 20 to 93. A total of 54 patients (55.1%) showed sinusoidal rhythm while 44 patients (44.9%) showed atrial fibrillation (AF) rhythm. The mean age of male patients was 48.08 ± 13.88 and that of female patients

was 44.44 ± 13.55 . No significant difference was observed between the mean ages of the two genders ($P=0.205$).

Clinical and echocardiographic information on patients is presented in Table (1) by gender. The catheterization information obtained from patients before PTMC is also shown in Table (2) while catheterization information obtained following PTMC is presented in Table (3). The mean PAP levels of patients obtained before, immediately after and 6 months after PTMC is shown in Table (4) for both genders.

No significant difference was observed in the levels of PAP before, immediately after and 6 months after PTMC in female and male patients. The mean PAP level in patients was $46.94 \pm 15/56$ before PTMC. Moreover, the mean PAP levels immediately after PTMC and 6 months after PTMC were 35.20 ± 7.44 and 31.10 ± 3.30 , respectively. The mean levels of PAP immediately after PTMC were significantly lower than the mean levels of PAP before PTMC ($P<0.001$). The mean levels of PAP six months after PTMC were significantly lower than the mean levels of PAP before PTMC ($P<0.001$). The mean levels of PAP six months after application of PTMC to the patients were significantly lower than the mean levels of PAP immediately after PTMC ($P<0.001$). A significant decrease in the mean levels of PAP was observed following PTMC ($P<0.001$).

In this study, MS patients hospitalized in the Shahid Madani Hospital and exposed to PTMC were selected. Variations of PAP were studied in these patients. The mean levels of PAP before PTMC, immediately after PTMC and six months after PTMC were calculated to be 46.94 ± 15.56 , 35.20 ± 7.44 and 31.10 ± 3.30 , respectively. Statistical analyses revealed a significant decrease in PAP levels as a result of PTMC.

In a study by Hung et al. which was carried out in the Chang Gung Memorial University (Taiwan) on MS patients treated with PTMC, a mean PAP level of 38.8 ± 12 was reported before application of PTMC. After PTMC, the PAP level declined significantly and reached 30.6 ± 10.3 (1). In another research by Wu et al. in the Chang Gung Memorial University of Taiwan, the effect of PTMC on PAP levels of MS patients was analyzed. These researchers stated that the mean level of PAP was 41.5 ± 10.7 before PTMC, which was reduced to 29.2 ± 10.9 after PTMC. The decrease reflected the significant contribution of PTMC to the decrease in PAP levels of MS patients (2).

Trevino et al. carried out a study in Division Medico-Quirurgica University of Mexico on MS patients. In their research, they measured PAP levels before and after PTMC. They reported mean PAP levels of 41.3 ± 16.1 and 26.4 ± 10.5 before and after PTMC, respectively. Therefore, a significant decrease was observed in the mean level of PAP of MS patients after the PTMC (3).

Similar to the above studies, the mean level of PAP obtained in the present study before PTMC was 46.94 ± 15.56 . This value was reduced to 35.20 ± 7.44 and 31.10 ± 3.30 following the PTMC and the decrease was statistically significant.

In a study by Kabukcu et al. (2005) in the cardiology department of Akdeniz University of Turkey, patients suffering from MS were studied. These researchers stated that MS patients with AF rhythm were significantly older (). Moreover, the mean levels of LVEDD (left ventricular end-diastolic dimension) were 52.3 ± 8.7 and 47.7 ± 8.7 in patients with AF rhythm and sinusoidal rhythm, respectively. Hence, the mean LVEDD was significantly higher in patients with AF rhythm (4).

Table.I Clinical and echocardiographic information of patients

	Gender		Total	P
	Male	Female		
MVA	0.97 ± 0.19	0.92 ± 0.21	0.94 ± 0.20	0.218
LAD	4.89 ± 0.62	4.56 ± 0.34	4.68 ± 0.48	0.011
RAD	3.23 ± 0.40	6.34 ± 13.25	5.60 ± 11.62	0.387
EF	52.32 ± 3.06	52.69 ± 5.04	52.55 ± 4.38	0.692
MV Score	9.14 ± 1.31	8.98 ± 1.31	9.04 ± 1.31	0.574
LVEDD	4.78 ± .53	4.52 ± 0.50	4.61 ± 0.52	0.024

Table.II The catheterization information obtained from patients before PTMC

	Gender		P
	Male	Female	
Systolic Aort	136.36 ± 18.55	130.74 ± 25.56	0.271
Dyastolic Aort	74.24 ± 8.11	73.88 ± 8.53	0.843
Systolic LV	137.54 ± 20.13	129.38 ± 23.17	0.090
Dastolic LV	13.46 ± 6.41	13.50 ± 5.32	0.973
LA	28.30 ± 8.78	27.81 ± 9.20	0.817
RA	10.17 ± 5.06	10.43 ± 5.96	0.875
Systolic RV	59.59 ± 23.61	57.43 ± 21.29	0.714
Dastolic RV	10.64 ± 4.30	11.54 ± 5.05	0.484
Systolic pA	48.97 ± 17.87	46.61 ± 15.34	0.496
Dastolic pA	25.14 ± 10.68	25.70 ± 10.56	0.805

Table.III The catheterization information obtained from patients after PTMC

	Gender		P
	Male	Female	
Systolic Aort	136.45 ± 18.08	130.49 ± 26.46	0.266
Dyastolic Aort	73.97 ± 8.15	73.95 ± 8.11	0.991
Systolic LV	137.66 ± 19.59	127.33 ± 25.29	0.054
Dastolic LV	24.59 ± 40.53	15.73 ± 10.91	0.149
LA	17.30 ± 6.35	17.87 ± 12.22	0.815
RA	8.00 ± 4.40	8.44 ± 3.28	0.820
Systolic RV	58.50 ± 27.62	54.61 ± 16.26	0.641
Dastolic RV	15.10 ± 11.44	13.17 ± 14.38	0.718
Systolic pA	35.50 ± 6.99	35.13 ± 7.66	0.826
Dastolic pA	24.63 ± 9.21	26.43 ± 10.20	0.391

Table.IV PAP levels of patients obtained before, immediately after and 6 months after PTMC

	Gender		Total	P
	Male	Female		
PAP Before PTMC	48.97 ± 17.87	46.61 ± 15.34	47.51 ± 16.29	0.496
PAP after PTMC	35.50 ± 6.99	35.13 ± 7.66	35.26 ± 7.41	0.826
PAP 6 month After PTMC	31.17 ± 3.39	31.07 ± 3.29	31.10 ± 3.31	0.893

Noor et al. (2009) performed a study in the cardiology department of Karachi University. They studied the effect of PTMC on echocardiographic and angiographic parameters of MS patients and stated that the level of PAP decreases significantly in these patients immediately after PTMC (5).

In a study by Mahan et al. in the cardiology department of New Delhi University (India) the immediate and delayed effects of PTMC on MS patients were studied. These researchers stated that the level of PAP declines significantly following PTMC. Moreover, delayed examinations indicated that PAP levels drop after PTMC as compared to PAP levels before PAP (6).

Bahl et al. carried out a study in the cardiology department of New Delhi University in India. They examined PTMC results of MS patients and stated that PTMC is a safe and effective method that can be applied to patients with acute pulmonary hypertension. They stated that this method gives satisfactory results (7). In a study by Takarada et al. in the cardiology department of Himeji University of Tokyo (Japan), the short-term effect of PTMC on MS patients was analyzed. They stated that application of PTMC to these patients is useful and it is more effective for younger patients (8). Hung et al. examined the effect of PTMC on MS patients and stated that in MS patients the mean level of PAP was 39.7 ± 13 prior to the PTMC while it was 30.6 ± 10.9 after the PTMC. The decrease in PAP was shown to be significant (9).

In another study by Drighil et al., which was carried out in the cardiology department of Ibn Rochd University of Casablanca (Morocco) in 2012, the effect of PTMC on MS patients was studied. These researchers reported a significant decline in pulmonary systolic blood pressure of patients from 50.2 ± 26.9 to 32.2 ± 12.2 following PTMC

(10). Karthikeyan et al. conducted a study in the cardiology department of New Delhi (India) in 2011. They examined effect of PTMC on MS patients and stated that PAP (pulmonary artery pressure) decreases significantly in MS patients following PTMC (11).

In a study by Strimahachota et al. (2001) in the cardiology department of Bangkok University (Thailand) the effect of PTMC on patients suffering from MS was examined. According to their report, MS patients with AF rhythm were older and the mean PAP level in patients with AF rhythm was significantly higher than patients with sinusoidal rhythm (12).

Similar to above results, MS patients with AF rhythm examined in the present research were older. That is to say, the mean age of patients with sinusoidal rhythm was 40.72 ± 11.87 years while that of MS patients with AF rhythm was 52.06 ± 13.35 years. Therefore, the mean age of patients with AF rhythm was significantly higher ($P < 0.001$).

Results of the present study and other studies conducted on MS patients suggested that the level of PAP is high in these patients. However, no difference in the levels of PAP was observed between the two genders. That is to say, both genders demonstrated similar levels of decline in PAP following PTMC. No significant difference was also seen between the response of female and male patients to the treatment as well as variations of their angiographic parameters.

Conclusion

Of the 98 patients studied in this research, 37 were male (27.8%) and 61 were female (62.2%). The mean age of patients under

study was 45.81 ± 13.72 years and the ages varied from 20 to 94 years. The heart rhythm of 54 patients (55.1%) was sinusoidal while that of 44 patients (44.9%) was AF. No significant difference was observed between the PAP levels of female and male patients before, immediately after and 6 month after PTMC.

The mean PAP levels of patients before PTMC, immediately after PTMC and 6 months after PTMC were 46.94 ± 15.56 , 35.20 ± 7.44 and 31.10 ± 3.30 , respectively. The mean levels of PAP immediately after PTMC and 6 months after PTMC were significantly lower than PAP levels measured before PTMC. The mean PAP levels measured 6 months after PTMC were significantly lower than PAP levels measured immediately after PTMC. There was a significant decrease in the mean levels of PAP after PTMC as compared to mean levels of PTMC prior to PTMC.

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