

PROFILE OF ECHOCARDIOGRAPHY IN PATIENTS WITH MITRAL STENOSIS AT DR. WAHIDIN SUDIROHUSODO HOSPITAL

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Abstract

Objective: To find out the echocardiographic profile of mitral stenosis patients at Wahidin Sudirohusodo Hospital

Methods: This research is descriptive quantitative, which was conducted at the Wahidin Sudirohusodo Hospital Makassar. The variables assessed consisted of mitral stenosis profile, gender, age, mitral valve area, complications of mitral stenosis, stenosis of mitral valve disorders, and involvement of mitral valve stenosis.

*Results: In this study there were 101 subjects. Based on demographic data, more mitral stenosis was found in women (62.4%) than in men (37.6%). By age, it was ≤ 45 years and > 45 years. Mean age was 41.17 (11.86) years. The number of subjects in the age range ≤ 45 years was 59.4%, aged > 45 years was 40.5%. Severity of mitral stenosis is based on mitral valve area (MVA) with a mild MS 6.9%, moderate MS 10.9%, and MS severe 82.2%. Severity of MS was based on the Wilkins score as a prediction of the success of interventions such as PTMC showing a score of > 8 by 56.4% while a score of ≤ 8 was 43.6%. The incidence of complication of mitral stenosis with AF was 51.5% and thrombus was 9.9%. Pulmonary hypertension was 59.4%. MS with Heart Failure 72.3%. Incidence of MS with valve disorders like aortic regurgitation was obtained by 50.5%, aortic stenosis 12.9%. Tricuspid regurgitation was 46.5%. Meanwhile, pulmonary regurgitation was found to be 34.7%, and mitral regurgitation was found 48.5%. MS with the number of valve involvement, MS with 1 valve involvement was 14.9%. And more than 1 valve obtained a percentage of 48.5%.
*Conclusion: For the last 4 years, it was found 101 cases with mitral stenosis at Wahidin Sudirohusodo Hospital. Generally, it is dominated by severe mitral stenosis with the most complications being heart failure and affecting 1 or more than 1 other valve.**

Key Words : *Mitral Stenosis, Valve disorders and Heart failure*

1. Introduction

Mitral stenosis is a mechanical obstruction of blood flow from the left atrium to the left ventricle. The main cause of mitral stenosis is rheumatic heart disease. Mitral stenosis is still a serious problem in western countries, 12% of heart valve disease is found in immigrants who immigrate from developing countries. Rheumatic fever is still often found in children and often affects children between the ages of 5-15 years. The latest data regarding the prevalence of rheumatic fever in Indonesia, namely for the years 1981 - 1990 was found to be 0.3-0.8 among 1000 school children.^{1,3}

Prevention of heart failure can be done by minimizing the various risk factors that influence it, cases of mitral stenosis require supporting investigations such as echocardiography to describe the patient's heart condition and as a supporting examination to rule out a differential diagnosis.²

The incidence, morbidity, and mortality rates of mitral stenosis are still high in developing countries including Indonesia, but research data on mitral stenosis disease in Indonesia is still very minimal. As one of the Regional Heart Centers in eastern Indonesia, Dr. WahidinSudirohusodo also hasnot published data on the description of patients with mitral stenosis.

Based on the description of the background, the researchers felt the need to conduct research on the echocardiographic profile of patients with mitral stenosis at Dr. WahidinSudirohusodo.

2. Method

Research subject

This type of research is descriptive quantitative, which was conducted at the WahidinSudirohusodo Hospital Makassar. The variables assessed were the Mitral Stenosis Profile, gender, age, mitral valve area, complications of mitral stenosis, stenosis of mitral valve disorders, and involvement of other cardiac valves.

Inclusion Criteria

Mitral stenosis patients with data on the mitral stenosis patient's medical records, accompanied by echocardiographic examination results.

Exclusion Criteria

Mitral stenosis patients with incomplete data from echocardiography examination.

Data collection

This study used secondary data obtained from the medical records of patients with mitral stenosis at DR WahidinSudirohusodo Hospital from 2017 to 2020. Data obtained from the medical record installation section of the DR WahidinSudirohusodo Hospital Makassar, medical records of selected mitral

stenosis patients as samples, collected and recorded tabulations according to the variables studied.

Statistical Analysis

Data were collected from medical records at DR Wahidin Sudirohusodo Hospital. These data of quantitative descriptive were analyzed using a computer program Statistical Product and Service Solutions (SPSS).

Ethics Permit

In the implementation of this research, each action was carried out with the consent and knowledge of the patient who was used as the research sample through the consent form or informed consent and was declared to meet the ethical requirements to be carried out by the Biomedical Research Commission on Humans, Hasanuddin University Medical Faculty with the number:364/UN4.6.4.5.31/PP36/2020

3. Results

The research was conducted at Wahidin Sudirohusodo Hospital, the research data were analyzed from 2017 to 2020 until the research subject was fulfilled, then it was obtained 101 medical records of Mitral Stenosis (SM) patients that met the inclusion criteria of this study, so that the total study sample used in this study was obtained, amounting to 101 medical records.

Table 1 Distribution of frequency and percentage of MS Degrees based on Demographic characteristics and Wilkins Score

Characteristics	category	Frequency	%
Gender	Women	63	62.4
	Man	38	37.6
Age	≤ 45 year	60	59.4
	> 45 year	41	40.5
MS Degrees Based on MVA	Mild	7	6.9
	Moderate	11	10.9
	Severe	83	82.2
Wilkins Score	≤ 8	44	43.6
	> 8	57	56.4
Total		101	100.0

General description of the sample obtained. The degree of mitral stenosis based on demographic data was found to be more in women (62.4%) than in men (37.6%). The age of the research subjects was from ≤ 45 years old to > 45 years old. Mean age was 41.17 (11.86) years. The number of subjects in the age range of ≤ 45 years was 59.4%, aged > 45 years was 40.5%.

The degree of mitral stenosis was based on the mitral valve area (MVA) with a mild degree of 6.9%, a moderate degree of 10.9%, and a severe degree of 82.2%.

The distribution of MS degrees was based on the Wilkins score as a prediction of the success of interventions such as PTMC. From a total number of 101 respondents who showed a score of > 8 was 56.4% while a score of ≤ 8 was 43.6%.

Table 2 Distribution of Frequency and Percentage of Mitral Stenosis complications

Variables	F	Percentage
AF	52	51.5
Thrombus	10	9.9
pulmonary hypertension	60	59.4
Heart failure	73	72.3

AF: *Atrial Fibrillation*

In the variable of mitral stenosis complications, respondents who stated that they had AF were 51.5% and thrombus was 9.9%. Pulmonary hypertension was as much as 59.4%. Cardiac Failure by seeing a decrease in systolic (EF and TAPSE) and diastolic (E / A value $<1, > 2$) added to the presence of pulmonary hypertension and dilatation of the heart chambers was found to be 72.3%.

Table 3 Distribution of Frequency and Percentage of Valve Faults in MS

Variables	F	Percentage
Aortic regurgitation	51	50.5
Aortic stenosis	13	12.9
Tricuspid regurgitation	47	46.5
Pulmonary regurgitation	35	34.7
Mitral regurgitation	49	48.5

In the valve disorders variable in MS, aortic regurgitation (AR) was obtained as much as 50.5%. MS with aortic stenosis was as much as 12.9%. MS with tricuspid regurgitation was 46.5%. Meanwhile, MS with pulmonary regurgitation (PR) was found to be 34.7%. And MS with mitral regurgitation was found to be 48.5%.

Table 4 Distribution of Frequency and Percentage of Number of Valve Involvement in Mitral Stenosis

MS with Valve Engagement	Number Valves	F	Percentage
	1	15	14,9
	> 1	49	48,5

MS: *Mitral stenosis*

In MS with the number of valve involvement in MS with 1 valve involvement was 14.9%. And category of more than 1 valve obtained a percentage of 48.5%.

4. Discussion

This study included 101 subjects aged between 19-68 years and was dominated by women. This study again shows that most mitral stenosis affects women compared to men. The results of this study were the same as those of Mohammad Reza, 2006, which showed that the number of female mitral stenosis sufferers based on echocardiography results was 12,926 or 53%, this figure was greater than the number of male mitral stenosis sufferers of 11,339 or 47%. Ratio between women and men was 2: 1.⁴

In this study, MS based on the Mitral Valve Area or area of the mitral valve area was obtained from 101 patients whose echocardiography examination was found to have mild degree of 6.9%, moderate degree of 10.9%, and severe degree of 82.2%. This result is in line with the study by Setiawan et al, stated in his research that echocardiography examination in patients with mitral stenosis found that 4.76% had mild mitral stenosis, 23.81% had moderate mitral stenosis and 71.43% had severe mitral stenosis. The mean mitral valve area was 0.81 ± 0.36 cm.⁹

The results of the MS degree depiction based on the Wilkins score as a prediction of the success of interventions such as PTMC from the total number of 101 respondents indicating a bad prediction category Score of > 8 was 56.4% while the good prediction category with a score of ≤ 8 was 43.6%. This result is in line with the results of the study by Sobia Mughal et al., The success result of PTMC with MVA ≥ 1.5 was 88.2% while it was unsuccessful in 11.8% of patients. Success with a Wilkins score of < 8 was obtained in 22 (95.6%) and unsuccessful in 1 (4.3%) patient. Meanwhile, the Wilkins score of ≥ 8 was still successful in 75 (86.2%) and unsuccessful in 12 (13.7%) patients.¹⁰

The distribution of complications of mitral stenosis with AF was 51.5% and thrombus was 9.9%. Pulmonary hypertension as much as 59.4%. Cardiac Failure by seeing a decrease in systolic (EF and TAPSE) and diastolic (E / A value $< 1, > 2$) added to the presence of dilated heart chambers was found to be 72.3%. This result is in line with the study of Leilipourafkari et al., Of 819 patients with mitral stenosis who were screened, 603 were included in the study and grouped according to sinus rhythm or atrial fibrillation obtained. Two hundred (33%) patients had atrial fibrillation 26. As for thrombus incidence, Gupta et al., suggested that atrial fibrillation (AF) is probably the most common arrhythmia associated with stroke in RHD patients and that the presence of subclinical AF is often a cause of systemic thromboembolism.¹¹

Management of patients with MS is based on the severity of MS. MVA (Mitral Valve Area) is the main criterion, which is clinically significant defined as MVA ≤ 1.5 cm². There is an agreement that MS is significant if the MVA is < 0.9 or 1 cm² / m² of body surface area. The mean transmitral gradient, seen from the transmitral velocity curve is less useful because it depends on heart rate, rhythm and cardiac output, but can still be used as an indicator and prognostic determinant.⁵

The results of research from Bertha et al., 2018 showed that by utilizing the good temporal resolution of the M-mode modality, the velocity propagation (Vp) method of mitral inflow assessed by color M-mode was found to be statistically significant in estimating the severity and MVA of mitral stenosis.⁶

From the results of this study, it was found that the distribution of complications of mitral stenosis with AF was 51.5% and thrombus was 9.9%. Pulmonary hypertension was as much as 59.4%. Cardiac Failure by seeing a decrease in systolic (EF and TAPSE) and diastolic (E / A value <1,> 2) added to the presence of dilated heart chambers was found to be 72.3%.

This increased risk of mortality was also reported by Magoni et al (2002) due to complications in the form of pulmonary hypertension (PH) and heart failure which affects nearly half of mitral stenosis patients. The risk of complications that gradually threaten life and reduce the quality of life continues to be a concern because an estimated 15 million people worldwide suffer from rheumatic heart disease (the main cause of mitral stenosis).⁷

Based on the results of the MS study with valve disorders, it was found that aortic regurgitation (AR) was 50.5%. Aortic stenosis was as much as 12.9%. The tricuspid regurgitation was 46.5%. Meanwhile, MS with pulmonary regurgitation (PR) was found to be 34.7%. And MS with mitral regurgitation was found to be 48.5%.

In MS with total valve involvement, MS with 1 valve involvement was found to be 14.9%. And Category of > 1 valve obtained a percentage of 48.5%.

Mitral regurgitation occurs in 95% of patients with acute rheumatic carditis which is the dominant cardiac abnormality in acute rheumatic fever patients. In mitral regurgitation, there is a combination of annular dilation, elongasi chordae which causes disruption of valve closure, anterior valve prolapse and, rarely, mitral valve leaf flails.⁸This result is in line with the study of Tito et al., on changes in mitral valve morphology in acute rheumatic fever and rheumatic heart disease, which stated that the most common heart valve defects involve the mitral valve, followed by the aorta and tricuspid.⁸

The research conducted by Jonathan et al, 2016 challenged the description of heart valve abnormalities in patients with rheumatic heart disease and congenital heart disease in adults at Prof. cases (50%), IRT 5 cases (63%), mitral stenosis 7 cases (24%), most CHD patients ASD 5 (62.5%), women 7 cases (87.5%), 31-40 years 3 cases (37.5%), tricuspid regurgitation 5 cases (42%), 7 cases with no history of CHD.⁹

5. Summary

- a) Demographically, the incidence of mitral stenosis is higher in women than in men, and more in the age range of ≤ 45 years.
- b) The average patient who comes is already at the severe stenosis of mitral stage and has several complications, then the severity of MS based on

the Wilkins score is the highest score of > 8 so that surgery has a high enough risk or poor prognosis

- c) Patients who come generally have experienced heart failure with decreased diastolic function and ventricular systole, as well as the dilatation of the heart chambers
- d) In addition to heart failure, most other valve disorders are found in the aortic valve, both regurgitation and stenosis, which are associated with rheumatic fever.

6. Conclusion

Patients with mitral stenosis at WahidinSudirohusodo Hospital for the last 4 years was found 101 cases. Generally, it was dominated by severe mitral stenosis with the most complications being heart failure and affecting 1 or more than 1 other valve.

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Conflict of interest

We have no conflict of interest to declare.

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