

Cardiovascular Management in Patients with Rheumatic Heart Disease in Hospitals: Case Study

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ABSTRACT

Rheumatic Heart Disease (RHD) is a disease that rarely affects individuals. RHD occurs due to inflammation caused by group A streptococcal bacteria and can cause heart failure. RHD in Indonesia is still rare, and it is being discussed about how to handle it. The purpose of this case report is to describe nursing issues in people with RHD. The case is about 43-year-old woman who has been diagnosed with RHD since January 2022. She was taken to the hospital with complaints of heavy breathing, and her main complaint when she was treated was a feeling of palpitations all the time, and she was easily tired. The main nursing problem was found, namely decreased cardiac output. The interventions provided were non-pharmacological therapy in the form of providing a semi-Fowler's position, a cardiac diet, education, and collaboration in providing pharmacological therapy. After intervention for three meetings, the result was no longer feeling short of breath and increased patient and family knowledge about self-management of heart disease. This case report describes PJR patients by applying evidence-based practice, so it is hoped that it will be useful for health professionals to understand the assessment process for evaluation and especially how to treat patients with non-pharmacological therapy for nurses.

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1. INTRODUCTION

Rheumatic Heart Disease (RHD) is a disease caused by Rheumatic Fever (RF) or rheumatic fever, which is a systemic disease complication of group A beta-hemolytic streptococcus (GABHS) pharyngitis infection. [8]

Around 17.9 million deaths each year in the world are caused by cardiovascular disease, which is a group of heart and blood vessel problems, such as rheumatic heart disease, cerebrovascular disease, coronary heart disease, and other diseases. [10]. Meanwhile, based on Riset Kesehatan Dasar (Riskesdas) in 2018 it was found that 15 out of 1000 people, or around 2.7 million people in Indonesia suffer from heart disease. [16].

In 2020, Rheumatic Heart Disease (RHD) causes 288,348 deaths annually in the world which accounts for around 2% of deaths from heart and blood vessel disease which is the number one death globally. [21]. In Indonesia in the year 2015, the number of RHD cases was 1.18 million, ranking fourth in countries with the largest estimated number of RHD cases. [19]

In general, before RHD occurs, it usually starts with rheumatic fever, which is characterized by fever, as well as inflammation of the throat, and can get worse and symptoms of heart failure occur. Signs and symptoms found in RHD sufferers can include palpitations or a feeling when the heart is beating fast, easily tired, shortness of breath, ECG images where conduction disturbances occur, low blood pressure, and S3 and or S4 heart sounds, these symptoms and symptoms refer to the direction of decreased cardiac output in nursing diagnoses [5].

Nursing diagnoses that often appear in RHD are decreased cardiac output, so cardiovascular management is needed, or in nursing interventions for Cardiac Care, namely by observing signs of

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decreased cardiac output, semi-Fowler's position to reduce tightness, providing an appropriate cardiac diet, health education regarding heart management to increase patient and family knowledge and reduce the occurrence of re-hospitalization [13].

Furthermore, further investigations are needed to be able to diagnose RHD. Management of RHD can be divided into prevention and long-term management. Primary prevention of RHD centers on the prompt recognition and treatment of group A streptococcal pharyngitis to prevent the development of acute rheumatic fever. If the patient has heart failure due to valvular disease, the patient should be given well-tolerated medical therapy for heart failure including angiotensin-converting enzyme (ACE) inhibitors, diuretics, and beta-blockers. Currently, there is no cure for RHD [3].

Different complaints can be felt by individuals which will affect different nursing problems and interventions for each patient. In this case report, the researcher aims to describe and know the manifestations and nursing problems that arise in RHD patients. Therefore, this report aims to describe the problems and management in the healing process in RHD patients.

2. METHOD

This case study was conducted on 15 – 17 July 2022 at the Regional General Hospital or RSUD. Before the start of nursing care, the authors obtained informed consent and written permission from the patient and family. In the early stages, the authors conducted medical examinations and interviews with patients and families to obtain subjective and objective data and problems experienced by patients.

3. RESULT AND DISCUSSION

Result

A 43-year-old female patient with a diagnosis of RHD since January 2022. The patient came to the Hospital Emergency Room on the evening of July 13, 2022, with complaints of shortness of breath (heavy breathing). Heavy breathing has been felt since noon. Two weeks before entering the hospital, the patient felt a sore throat, three days recovered without treatment, without fever, cough, or runny nose. In November 2021 complaints of chest pain have been felt. Previously, the patient had a history of stomach disease and was in control of treatment in December 2021. According to the patient's account, there was no family history of heart disease, diabetes mellitus, or hypertension.

A physical examination was carried out on July 15, 2022, the patient's main complaints were chest palpitations all the time, and pain in the left shoulder like being stabbed. Dizziness, difficulty sleeping, anxiety, and cold sweats. The feeling of chest palpitations will stop during rest, and get worse when the patient's hear bad news, sometimes when given medicine the palpitations are increasingly felt in the chest.

The results of the physical examination were the patient's awareness of composmentis, pulse: 68 bpm, respiration: 20 breaths per minute, blood pressure: 90/60 mmHg, SpO₂: 97%, and body temperature 36.5 C. Body weight when sick was 48 kg, experienced a drastic weight loss before getting sick of 70 kg. Height: 155 cm, BMI: 19.9 (Normal). Inadequate nutritional intake, because the patient has decreased appetite, and can only finish $\frac{1}{4}$ of the portion provided.

Examination of the chest Asymmetric chest inspection found swelling in the left chest, palpation: tenderness around the heart, auscultation: murmur. On palpation of the abdomen, there is tenderness in quadrants 6 and 9. Complaints of tenderness in the right armpit. There is a lump on the left wrist (subcutaneous nodule).

Investigations: Echocardiography (January 5, 2022) concluded that left atrial and left ventricular dilatation, normal left ventricle with systolic function, diastolic dysfunction could not be measured due to atrial fibrillation, moderate mitral stenosis due to RHD, mild mitral regurgitation, and right ventricular contractility normal. Photo Thorax (July 13, 2022) obtained the results: enlarged cast, normal sinuses, diaphragm, pulmo; hili closed splatter, broncho-vascular pattern increased, plus splatter in perihilar and bilateral pericardiac. Impression: Cardiomegaly with pulmonary congestion.

Table 1. Hemostasis (July 14, 2022)

Inspection	Results	Reference	Unit
Hemostatis			
PPT	16.6	10.8 - 14.4	seconds
PT			
PPT	1.44		
INR			
APTT	29.0	24 - 36	seconds

Table 2. Clinical Chemistry (Juli 15, 2022)

Inspection	Results	Reference	Unit
Clinical Chemistry			
Natrium (Na)	141	135 - 148	mmol/L
Kalium (K)	3.4	3.5 - 5.1	mmol/L
Kalsium (Ca)	8.54	8.1 - 10.4	mg/dL

Medical therapy is given to patients in the form of Ranitidine (2 x 150 mg/IV), Lasix (2 x 40 mg/IV), Warfarin (3 x 2 mg/PO), Ramipril (1 x 2.5 mg/PO), Bisoprolol (1 x 2.5 mg/PO), Erythromycin (2 x ½ tablet/PO), Digoxin (1 x 0.25 mg/IV), Sucralfate (3 x 1 teaspoon/PO), Curcuma (3 x 1 tablet/PO), KSR (1 x 1200 mg/PO), Calos (3 x 1 tablet/PO), 0.9% NaCl (500 ml, 5 tpm/IV), Trimetazidine (2 x 35 mg/IV, and Pantoprazole (2 x 40 mg/IV).

Based on the cases, the main nursing problem is a decrease in cardiac output associated with changes in contractility characterized by complaints of chest palpitations all the time (palpitations), as well as echocardiography results: left atrial and left ventricular dilatation, the left ventricle is normal with systolic function, diastolic dysfunction cannot be measured due to atrial fibrillation, moderate mitral stenosis due to RHD, mild mitral regurgitation, and normal right ventricular contractility, chest X-ray: cardiomegaly, pulse: 68 bpm, blood pressure 90/60 mmHg.

Interventions carried out to address major nursing problems are by setting a semi-Fowler's position to reduce shortness of breath, collaborating on a cardiac diet by reducing sodium which increases the risk of increased blood pressure which can trigger hypertension, advocating physical activity according to tolerance, and collaborating on the administration of pharmacological therapy.

Discussion

Rheumatic Heart Disease (RHD) is a life-threatening heart condition due to heart valve damage caused by one or more episodes of rheumatic fever, an autoimmune inflammatory reaction to a streptococcal bacterial infection (streptococcal pharyngitis or strep throat). [20]. Before establishing the diagnosis of RHD, there are diagnostic criteria that are commonly used, namely the Jones Criteria for Acute Rheumatic Fever. Major criteria: carditis (inflammation of the heart muscle), polyarthritis (arthritis felt in more than five places on the body), chorea (involuntary movement disorder of the body), subcutaneous nodules (deep lesions on the skin), and erythema marginatum (rash on the skin). Minor criteria: fever, arthralgia (pain or stiffness in the joints), prolonged PR interval on the ECG, increased ESR levels (blood sedimentation rate), presence of C-Reactive Protein (CRP), and leukocytosis (too many white blood cell counts). [4].

The diagnosis of rheumatic fever requires at least two major criteria, or one major and two minor criteria, together with evidence of GABHS infection detected by a streptococcal culture taken from the throat, an elevated streptococcal antibody titer, or a previous history of rheumatic fever or RHD. [17]. In this case, the patient had been diagnosed with RHD in January 2022. The major criteria found were: carditis characterized by auscultation examination results found a heart murmur and subcutaneous nodules, namely small lumps on the left wrist (bright, hard, not painful, not itchy, mobile). [14].

The minor criteria found in the patient, the results of the ESR examination were obtained, namely PPT PT (Prothrombin Time) 16.6 seconds with a normal value range of 10.8 – 14.4 seconds, there was an increase or more than the normal value. The PT examination aims to screen patients with blood

disorders and blood clots. Patients with cardiac diagnoses are advised to undergo routine hemostasis checks (PT, INR, APTT) by administering anti-coagulant medical therapy to prevent blood clots. [18].

The main complaint felt by patients is chest palpitations all the time with the main nursing problem, namely decreased cardiac output. Cardiac output is the amount of blood pumped by the ventricles into the pulmonary circulation and systemic circulation in one minute. There are two factors that affect cardiac output, namely heart rate per minute and stroke volume. The amount of cardiac output is affected by preload, afterload, and cardiac contractility. Decreased cardiac output occurs because the heart is inadequate in pumping blood throughout the body. As a result, the body feels easily tired and short of breath, and it is difficult to sleep.

Previously the echocardiography results obtained, namely moderate mitral stenosis due to RHD which is a condition of obstruction in the valve because it thickens and causes the opening to shrink thereby reducing the amount of blood flowing. [11]. Mild mitral regurgitation, namely the valve cannot close as before so it leaks and blood returns from the ventricles to the atria, this causes a decrease in cardiac output. [6].

Decreased cardiac output is caused by an imperfect mitral valve closing during systole, causing a decrease in blood supply to the aorta and returning blood flow from the left ventricle to the left atrium, this causes a decrease in ventricular stroke volume so that the heart compensates by dilating the left ventricle, increasing myocardial contraction, hypertrophy. ventricular chambers and atrial chambers so that there is a decrease in the ability of the left atrium to pump blood this causes pulmonary vein congestion and blood returns to the lungs causing pulmonary interstitial edema, pulmonary arterial hypertension, right ventricular hypertension it can cause right heart failure. [15].

The reason for the patient's admission to the hospital was heavy breathing, but it has been resolved and when the examination was carried out the results of the oxygen saturation were 97% without oxygen assistance. The results of the research by Najafi, Dehkordi, Haddam, Abdavi, & Memarbashi, in 2018 showed that changing the position to semi-fowler can affect oxygen saturation in heart patients. In this study, it was explained that initially the patient was placed in a semi-Fowler's position for 15 minutes, and oxygen saturation was measured at three points, namely the earlobe, the tip of the finger, and the tip of the big toe simultaneously. [9]. Next, the patient was placed in a supine and prone position, and oxygen saturation was measured in three places as before. The results showed that the average percentage of oxygen saturation had significant differences at different positions. The results of the Photo Thorax show that the patient has cardiomegaly with pulmonary congestion, this is caused by a buildup of fluid in the lungs which inhibits lung expansion which causes the patient to have difficulty breathing the reason for hospitalization. [1].

During the three days of treatment, the patient was always in a semi-Fowler's position and the percentage of oxygen saturation was always above 94%. The patient said that if he sleeps on his back, he will feel shortness of breath which is also felt after doing activities such as returning from the toilet. Previously, the patient said that his social aspects were reduced because he rarely left the house because he often felt tired quickly. According to research, the average heart patient is physically inactive which results in a low quality of life. Nurses are advised to be more proactive in providing related information to patients with chronic heart disease to be more physically active and to increase their self-confidence in various ways. [7].

The diet given while the patient is being treated is the Heart Diet, namely by controlling food portions, reducing fat and salt consumption, increasing low-fat protein sources, and fluid restrictions. Individual salt and fluid restriction may improve cardiac signs and symptoms without negative effects on thirst, appetite, or quality of life in patients with moderate to severe CHF and signs of prior fluid retention. [12].

Before the end of nursing care for patients, health education is given related to self-management for patients to reduce the re-hospitalization of patients at the hospital. Health education materials include medication adherence, dietary modifications, social support, and symptom control. Research that conducts interventions in the form of health education led by nurses during hospitalization and after discharge improves self-management skills in patients with chronic heart failure. [2]. After being given health education, patients and families seem to understand and plan to follow the recommendations that have been previously informed.

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Evaluation on the last day on July 17 2022 showed the following results: the feeling of shortness of breath has decreased, palpitations or palpitations have decreased, fatigue is still felt, the patient's consciousness is composmentis, blood pressure: 90/60 mmHg, pulse: 74 bpm, respiration: 19 breaths per minute, oxygen saturation: 99%, temperature 36 C, partially resolved nursing problems of decreased cardiac output, and continue semi-Fowler's positioning intervention, and recommend activities according to the patient's ability.

4. CONCLUSION

Patients with RHD have different signs and symptoms because there are major criteria and minor criteria that must be found before diagnosing it. The main management given to RHD patients is pharmacological therapy, namely the administration of antibiotics such as Erythromycin. Non-pharmacological therapy that can be applied is by providing a semi-Fowler's position which can reduce the feeling of shortness of breath, implementing a heart diet, and providing health education related to physical activity which can be done because usually, patients with RHD have activity intolerance, as well as health education regarding self-management of heart patients (medication adherence, dietary modifications, social support, and symptom control) which increase patient and family skills and reduce the incidence of re-hospitalization. This case report describes RHD patients by applying evidence-based practice so that it is hoped that it will be useful for health professionals to understand the assessment process to evaluate and especially how to treat patients with non-pharmacological therapy for nurses.

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