

## ORIGINAL ARTICLE

## KNOWLEDGE AND AWARENESS OF RHEUMATIC VALVULAR HEART DISEASE AMONG DIAGNOSED PATIENTS

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**Objectives:** To assess the knowledge about valvular heart disease among the patients who are already diagnosed with rheumatic valvular heart disease (RVHD).

**Methodology:** In this cross-sectional study was conducted at the outpatient of a tertiary care cardiac centre. We included consecutive patients of either gender between 18 to 60 years of age with the established diagnosis of RVHD. Their knowledge and awareness regarding the disease itself and regarding its primary and secondary prevention and treatment options was assessed with the help of a structured self-developed questionnaire.

**Results:** Among the study sample of 505 patients, 255 (50.5%) were male and overall mean age was  $37.3 \pm 10.9$  years. A majority (90.3%) of the patients had household income of  $\leq$  PKR 40,000 and 35.3% were illiterate. More than 41% were not aware of their diagnosis, 40% were aware of childhood infection as the cause of RVHD. About 40% of the patients could not recall history of fever/sore throat in past. About 19.8% of the patients considered percutaneous transvenous mitral commissurotomy as complete cure for RVHD and 46.3% of the patients were not aware of a prophylactic treatment. Only 33.9% considered the need to maintain good dental hygiene as part of the prophylactic treatment.

**Conclusion:** High incidence of lack of awareness regarding their disease and its prophylaxis in our study population is alarming. To improve the RHD awareness, sessions and seminars should be arranged in the general population. Further studies are required to identify the cause and hence identifying measures to improve awareness.

**Keywords:** rheumatic heart disease, acute rheumatic fever, Pakistan, knowledge

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## INTRODUCTION

Rheumatic heart disease is one of the most common and preventable heart diseases in the younger population, under 25 years.<sup>1</sup> The other cardiac disorders like ischemic heart disease, arrhythmias and cardiomyopathies which have many non-preventable (e.g. familial, genetic predisposition) etiologies, rheumatic heart disease is solely a late sequelae of Group A Beta Hemolytic streptococcal Infection. Hence it can be completely and truly prevented by early detection and management of this infection.<sup>2</sup>

In primary prevention of acute rheumatic fever (ARF), it is important to make early diagnosis and appropriate treatment for Group A streptococcal sore throat or else incompletely managed throat infection can lead to ARF in many patients and half of which can end up acquiring Rheumatic valvular heart disease.<sup>3</sup>

It is very clear from the literature that with the help of well-organized preventive programs this disease has been eradicated from many developed countries. But it's still the cause of morbidity and mortality in low- and middle-income countries.<sup>4,5</sup> In 2015, global regional and national burden of rheumatic heart disease reported the highest estimated numbers of death caused by rheumatic heart disease in India (119,100 deaths), Pakistan (1,900 deaths), China (72,000 deaths) with standardized death rates more than 10 deaths per 100,000 population. Reasons for this amount of death is poor sanitation, lack of awareness, affordability to get proper health care and medication, early diagnosis and treatment of childhood infection and education of poor populations in slum areas about treatable diseases.<sup>6</sup>

To acquire control over the burden of disease, there have been many programs launched internationally that included the Awareness, Surveillance, Advocacy and Prevention program (ASAP) in Africa,<sup>7</sup>

coordinated global response to rheumatic heart disease by the World health organization in 2018.<sup>8</sup> Despite having these programs, countries with low socioeconomic conditions face difficulty in getting control over the burden of Rheumatic valvular heart disease.

Patient knowledge and awareness about this disease play a key role in prevention and early detection of the disease. It is patient’s awareness about the disease and its complications that can solve the issues of late presentation, non-compliance to medication and not taking prophylactics. It can also solve lost to follow up issues as well.

The aim of this study was to assess the knowledge of the patients who are diagnosed with rheumatic valvular heart disease. This will help us in making future preventive strategies for this disease and also guide us in developing full blown rheumatic heart disease preventive cardiology program.

**METHODOLOGY**

This cross-sectional study was conducted at the National Institute of Cardiovascular Diseases (NICVD), Karachi, Pakistan between 22nd April 2021 and 21st July 2021. Consecutive patients were selected from the outpatient department of the institute. Patient with the diagnosis of rheumatic valvular heart disease for at least one year (echocardiographic confirmation), between 18 to 60 years of age of either gender were recruited. Patients with congenital heart diseases, ischemic heart diseases, and those who refused to give consent were excluded.

The study was started after approval from ethical review committee of the institute. Before including patients the purpose and benefits of the study were explained to all participants and informed consent was taken by investigators. Demographics and clinical characteristics of the patient were recorded like age (18 to 60 years), gender (male or female), house hold income (range of amount of income in rupees), education (the level of education they had acquired), occupation (profession from which they belong), history of fever and sore throat (If they remember any significant history of fever, sore throat or associated severe joint pain) as per the operational definitions.

Their knowledge and awareness regarding the disease itself and regarding its primary and secondary prevention and treatment options were assessed during a short face-to-face interview of the patients with the help of a structured self-developed questionnaire. The questionnaire was developed by the researcher under the supervision of senior cardiologist. The questions were phrased to the comprehension level of a common

man without assuming any level of literacy regarding medical terminologies at the patients end. For the patients with language barriers, services of a translator proficient in native language of the patients were received. The questionnaire was consisted of specific questions regarding awareness of patients regarding his/her own diagnosis, various causative factors for RVHD, available treatment options, and prophylactic and preventive measures. All the collected information was recorded using a predesigned proforma by an investigator. Patient information were kept secured and available to authorized persons only. Collected data were analyzed using IBM SPSS version 19. Quantitative (continuous) variables were summarized as mean ± standard deviation (SD) and qualitative (categorical) variables were expressed as frequency (%).

**RESULTS**

A total of 505 patients participated in the survey with a mean age of 37.3 ± 10.9 with almost equal numbers of male and female. Majority (60%) of them had an income between 20,000-40,000 PKR. Majority had received education primary school and above (Table 1).

**Table 1: Demographic distribution of patients with diagnosed rheumatic valvular heart disease**

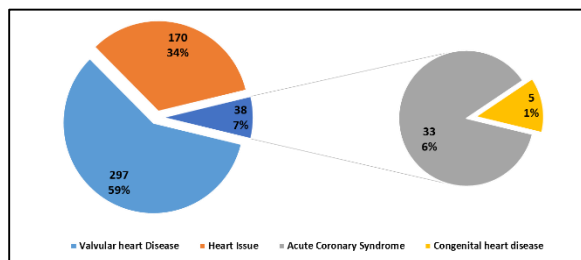
	Total
<b>Total (N)</b>	505
<b>Age (years)</b>	37.3 + 10.9
<b>Gender</b>	
Female	250 (49.5%)
Male	255 (50.5%)
<b>Income</b>	
<20,000	153 (30.3%)
20,000 - 40,000	303 (60%)
>40,000 - 60,000	46 (9.1%)
>60,000	3 (0.6%)
<b>Education</b>	
Illiterate	128 (25.3%)
Primary	145 (28.7%)
Secondary	123 (24.4%)
High school	60 (11.9%)
University	49 (9.7%)
<b>History of fever/sore throat</b>	
May be	52 (10.3%)
No	199 (39.4%)
Yes	254 (50.3%)

More than 40% were not aware of rheumatic valvular heart disease as their diagnosis Figure 1, 2. Around 40% of patients answered that childhood infection was the cause of their disease. Shortness of breath was the most common symptom. About 40% of the patients

could not recall history of fever/sore throat in past. Regarding PTMC approximately 19.8% were certain of it as the complete cure for mitral stenosis. Most of the patients were not aware of a prophylactic treatment for their disease. Of those who were aware of the prophylactic treatment, 11% did not choose injection Penicillin G Benzathine as the prophylactic measure. Only 33.9% considered the need to maintain good dental hygiene as part of the prophylactic treatment (Table 2).

**Table 2: Knowledge, attitude, and awareness of patients with diagnosed rheumatic valvular heart disease**

	Total
<b>Total (N)</b>	<b>505</b>
<b>Presenting symptoms</b>	
Chest pain	52 (10.3%)
Palpitation	115 (22.8%)
Shortness of breath	335 (66.3%)
Syncope	3 (0.6%)
<b>Percutaneous transvenous mitral commissurotomy as complete cure for mitral stenosis</b>	
Maybe	312 (61.8%)
No	77 (15.2%)
Yes	100 (19.8%)
Not available	16 (3.2%)
<b>Awareness about prophylactic treatment</b>	
No	271 (53.7%)
Yes	234 (46.3%)
<b>Prophylactic measures</b>	
Injection Penicillin G Benzathine	218 (89%)
Maintain good dental health (regular brush/floss, dental check-ups)	83 (33.9%)
Avoid getting skin infections	11 (4.5%)
Avoiding use of injection of recreational drugs	13 (5.3%)



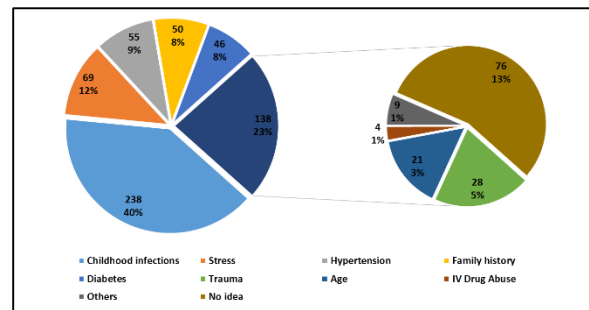
**Figure 1: Patients' awareness of diagnosis**

**DISCUSSION**

Rheumatic Heart disease constitutes a substantial burden on the healthcare system in developing nations. Knowledge about rheumatic heart disease is known to decrease the burden of the disease and helps in its prevention.<sup>8</sup> Many studies deem knowledge a tool for primary prevention of both ARF and RHD.<sup>9-12</sup> Also affiliated lack of awareness with the persistence of RHD.<sup>13</sup>

Patients' perception and knowledge plays a major role in prevention and eradication of rheumatic heart disease. Catering to a sample size of around 505 patients, our study adds up to the pool of very few studies conducted to assess the knowledge and awareness of rheumatic valvular heart disease among the patients already diagnosed with the disease in our setup.

Our study had an almost equal number of male (50.5%) and female (49.5%) participants, which was quite similar to a study by Prasad et al.<sup>10</sup>, which also had an equal number of male (48%) and female (52%) patients.



**Figure 2: Patients' awareness of cause of VHD**

Majority of low socioeconomic group is not surprising as this study was conducted at a tertiary care public sector hospital which manages most of the poor patients of the city. This is similar to other studies conducted in our region.<sup>8</sup>

Patients awareness regarding initial sign and symptoms of any preventable disease play a pivotal role in its detection and early management of the disease. This in turn will also lead to prevention of late complications. In our study due to their lack of knowledge most of the patients ignored the initial exposure of the disease as most of them were not able to recall history of fever and sore throat. This emphasise the need of general public awareness programs this is similar to the findings reported in other studies like Thakur et al.<sup>14</sup>

Once presented to the health care facility and Diagnosed by the physician, it is patient's awareness about his disease and its possible complications that makes him compliant to the treatment and keeps the patients in regular follow up. In our study more than one third of the patients were not aware of their diagnosis as only 58.8% knew rheumatic valvular heart disease at their diagnosis. One may blame majority low socioeconomic group for this .But on the other hand the study was conducted at the largest tertiary care cardiac hospital and most of the patients

were regular cardiac patients, still not knowing the diagnosis! It is an eye opener for health authorities, this would have been worse if study conducted in rural centres. This is supported by other studies. A study conducted in India, where 81% of patients had poor knowledge, and 9% of patients had insufficient knowledge regarding Rheumatic heart disease.<sup>8</sup> An important finding in Robertson et al. study was that patients most affected by RHD did not know much about their disease.<sup>15</sup> Alarming results were found from rural and urban Pakistan as only 19% of patients from Rahim Yar Khan and <8% cases from Lahore diagnosed with having RHD were aware of their diagnosis before the study.<sup>16,17</sup>

It is the childhood streptococcal sore throat infection that complicates and involves the heart. Early detection and management of this sore throat is the key in controlling this epidemic. Developed countries by controlling early childhood infections have successfully eradicated this disease from their communities. In our study one may feel satisfied by the fact that approximately half of the patients knew childhood infections as the cause of their disease. But considering the large number of people at risk this number is not satisfactory. This number although not satisfactory could also be a bias as our participants were mostly recruited from the outpatient clinical sites where they were receiving the injection of benzathine.

In our patients, shortness of breath was the most common symptom experienced by the patients, followed by palpitations. These findings are similar to a study conducted by Thakur JS et al.<sup>14</sup>, in India, where Breathlessness and palpitations were found in 34 (77.3%) and 15(34.1%) cases. However, history of recurrent joint pains (84%) and migratory joint pains (47.7%) were also quite common among patients in Thakur's study, which was surprisingly not reported by our patients.<sup>14</sup>

PTMC has been deemed the initial treatment of choice for severe mitral valve stenosis with favorable outcomes for most patients,<sup>1</sup> but this procedure does not alter the disease process and the disease is not cured. In our study only 15% of the patients were sure about this fact, majority were not sure and about 1/5 of the patient considered PTMC is as a complete cure of their disease. This misunderstanding leads to future non-compliance to the treatment and lost to follow up issues. This finding emphasize that the interventional cardiologist performing the procedure must properly counsel their patients.

The significance of secondary prophylaxis and secondary prevention in decreasing the burden of

RHD has been well acknowledged.<sup>5</sup> Compliance and adherence to secondary prophylaxis have been ascribed to prevent recurrences of ARF. Moreover, poor adherence to secondary prophylaxis has been directly linked to poor awareness.<sup>6</sup> About 53.7% of our patients despite being diagnosed with RHD cases were not aware of a prophylactic treatment for RHD which is consistent with a study on the general population in Taif, Saudi Arabia where 50.2% of the participants had no awareness regarding the secondary prevention of recurrent rheumatic fever<sup>18</sup> but these findings should not be considered a rule, because the Iranian study has proved that by developing good preventive cardiology program patients awareness can be improved, as in their study 86% of patients were found to have good knowledge concerning ARF treatment.<sup>19</sup>

It is proven from scientific data that along with injectable antibiotics patient also has to take general prophylactic measures like dental care. It was satisfactory to find in our study that majority of the patients correctly identified penicillin G benzathine as the prophylactic measure. But at the same time they had no idea about general prophylactic measures.

Our study finding indicate need of mass level awareness programs for the whole healthcare community. With RHD having no cure, its management mostly depends on prevention and control methods that can halt the disease progression patient awareness may not play a major role in the management but it may play a key role in prevention of RHD. Therefore, education and awareness regarding the disease, its complications, and adherence to secondary prophylaxis should be emphasised.<sup>20</sup>

Our findings also suggest that that controlling of this epidemic of rheumatic heart disease is beyond the capacity of a single cardiology team. We need to develop a community-based program like Awareness, Surveillance, Advocacy and Prevention (ASAP) initiated by WHO in Africa. At the same time we also need to conduct studies to find out the cause behind this lack of awareness of patients regarding their disease add modify our preventive cardiology programs and strategies according to the cause identified.

This study was conducted at a single center public sector hospital with patients profile mostly form low- or middle-income groups, hence findings of this study cannot be generalized to the entire population.

## CONCLUSION

Rheumatic heart disease poses a significant burden on the healthcare system and its prevention is beyond the capacity of a single preventive cardiology team. High incidence of lack of awareness regarding their disease and its prophylaxis in our study population is alarming. Since the disease is curable, general population should be made aware of the disease, its complications, and primary prophylaxis so that they consult a physician as soon as they witness a symptom. Awareness sessions and seminars should be arranged for the general population. Further studies are required to identify the cause and hence identifying measures to improve awareness.

### AUTHORS' CONTRIBUTION

SN and RAK: Concept and design, data acquisition, interpretation, drafting, final approval, and agree to be accountable for all aspects of the work. MTF, NUK, MS, AAA, and AMS: Data acquisition, interpretation, drafting, final approval and agree to be accountable for all aspects of the work.

**Conflict of interest:** Authors declared no conflict of interest.

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