

Prevalence of Rheumatic Heart Disease in Pakistan: A Meta-Analysis Study

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ABSTRACT

Aim: To determine the prevalence and risk factors of rheumatic heart disease in Pakistan

Study Design: A meta-analysis study.

Place and duration: Different regions of Pakistan in 2019.

Methodology: From different regions of Pakistan, the data of around 2000 individuals was collected by different electronic databases to identify the prevalence of rheumatic heart disease among individuals who are between the ages of 6 to 15 years old. The electronic data bases include google scholar, global health and PubMed.

Results: After the title and abstract screening of 1350 articles, 31 articles were sorted out in which 17 articles fulfilled our inclusion criteria. In this study, the population from different regions of Pakistan was collected. In 13 articles the prevalence was measured by echocardiography, cardiac auscultation and cardiac murmurs were used to determine the disease prevalence. Its prevalence was 15.8 per 1009 patients with a 95 % confidence interval (6.4–15.2) and by cardiac auscultation 13.9 per 991 patients with a 95% confidence interval (1.0–4.8).

Conclusion: It was found out that the rheumatic heart disease is quite prevalent in the region which have low and poor health infrastructure and facilities, and the regions with educated population who received quick treatment along with quick diagnosis of the disease.

Key words: Pakistan, Rheumatic heart disease, Survey, Prevalence

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INTRODUCTION

A disease associated with the abnormal immune response particularly caused by the group A streptococcal infection involving the vulvar damage is called as rheumatic heart disease. This disease is more common in childhood and quite prevalent in the developing countries as it has an association with poverty [1]. Due to its close association with poverty, the disease is nearly absent in the developed first world countries. Developed nations have played their part in almost eradicating the rheumatic heart disease by opting the preventive measures particularly the use of

penicillin and maintaining the proper hygiene and clinical safety standards because of the social and economic development [2]. The regions across the globe where the this disease is an endemic, 80-85% i.e. almost 2 billion children who are under the age of 15 years are affected with rheumatic heart disease as researched by Population Reference Bureau (2008) [3].

Across the world the major reason of heart failure among young adults and children is rheumatic heart disease [4]. This often results in either premature death or a disability of some sort which affects the labour and workforce of such nations, which is why this disease is a serious burden on healthcare system in developing countries. The morbidity and mortality associated with cardiovascular diseases caused solely by rheumatic heart disease is

responsible for causing 250000 deaths per year [5]. In the next 20 years, it is expected that the poor access to birth control and increase in rural population would result in a substantial increase in the people who are at risk of developing rheumatic heart disease as observed by the demographic trends in developing countries [6].

Acute rheumatic fever (ARF) is developed 3 weeks after the infection of group A Streptococci and affects heart, brain, skin and joints [7]. Almost half of the population suffering from ARF have cardiac inflammation particularly involves valvular endocardium, and it may cause severe damages to valves.

Rheumatic heart disease results from cumulative damage of valves because of the recurrent pauci symptomatic episodes of ARF [8]. Adverse outcomes can be prevented by adapting secondary preventive measures. Identification of the silent rheumatic disease can be made possible by early echocardiography [9].

The current study involves reviewing the population based data which involves the adolescents and children suffering from this disease in low or middle income countries such as Pakistan and to observe the lapses in treatment. Particularly, the trends of increasing prevalence of rheumatic heart disease and their risk factors in children and adolescents in different regions of Pakistan are observed in this study.

METHODOLOGY

From different regions of Pakistan, the data of around 2000 individuals was collected by different electronic databases to identify the prevalence of rheumatic heart disease among individuals who are between the ages of 6 to 15 years old.

In the current meta-analysis study, all the data was gathered very carefully and autonomously by the team of our researchers. Evidence based method was used to gather data from different population areas depending upon different researches.

Different socio-demographic variables were considered during this study. Special care was taken in the screening protocol, data sorting and sampling techniques. As no direct data analysis is available for analyzing epidemiological prevalence, so regression analysis was used to conduct this analysis. The data about rheumatic heart disease in children and young adults was searched on different electronic databases. The age group included children who are between the ages of 6 to 15 years old.

The articles which were published in Pakistan during the period of 2000 till 2016 were searched on PubMed, google scholar, and global health search engines. The data of around 2000 individuals was collected from different areas of Pakistan. Similarly evident and clinically silent rheumatic disease in different geographical regions was evaluated in meta-analysis. The raw data was measured by meta-analysis

technique. On the basis of prevalence, different estimates were measured. Age and sex was measured in each region by using the regression analysis. The poor hygienic condition and social inequality was analyzed by using regression analysis. Organogram presented in Figure 1 represents the data selection.

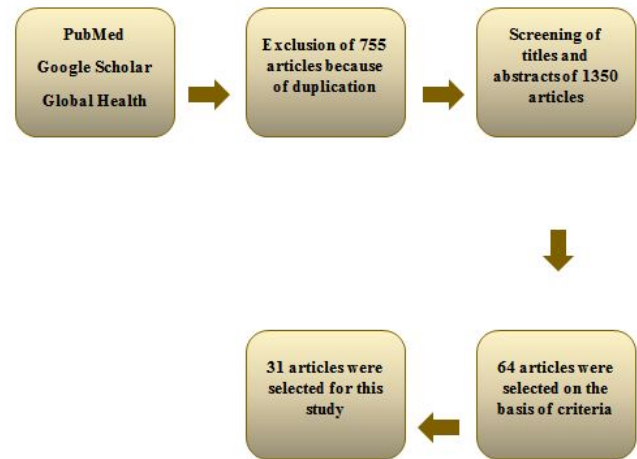


Figure 1: Organogram representing the process of data selection.

RESULTS

In the present study, the patients we screened include children and young adults less than 15 years of age. The criteria of choosing children and young adults were that the subjects must have some heart related pathological problems.

Among the patients who were under study most of them were unaware of their heart problems and basic health and sanity measures in the low or middle income countries like Pakistan. We screened articles on google scholar, PubMed, and global health, out of which 755 articles were excluded because of duplication.

After that 1350 articles were screened on the basis of their titles and abstracts. On the basis of criteria, further 64 articles were short listed, and then 31 different research articles were sorted out. Out of those 31 articles fulfilled our inclusion criteria.

In the current review population from 23 different regions was included. Among the 17 articles, in 13 researches, echocardiography was used to determine the disease prevalence along with cardiac auscultation and the assessment of cardiac murmurs. By echocardiography, the rheumatic heart disease's prevalence was 15.8 per 1009 patients with a 95 %confidence interval (6.4–15.2) and by cardiac auscultation 13.9 per 991 patients with a 95%confidence interval (1.0–4.8) as given in Table 1.

It was also observed that cardiomyopathy is more prevalent in the patients with older age.

Table 1: Characteristics of the researches included.

Screening country	Year	Urban (%)	Sampling	Sample size	Auscultation	Echo	Age
India	1991-1992	-	Community	1345	-	+	0-14
Bangladesh	1991	-	Community	5521	+	+	6-16
Pakistan	2007	92	Not defined	1523	-	+	4-13
Yemen	1999	87	Schools	4500	-	+	NA
Nepal	1998	96	Schools	4300	-	+	4-14
Pakistan	2003	-	Schools	1700	+	-	3-14

DISCUSSION

The current study just like the previous studies determined that rheumatic heart disease is quite prevalent in all regions particularly rural areas of Pakistan [10]. The disease was more prevalent in the children aged 5-16 years. Similarly, silent rheumatic heart disease is 7 times more clinically progressive in nature than the disease which can be clinically diagnosed. Similarly our findings also correlated with the previous studies that the rheumatic heart disease is more prevalent in the middle or low income areas with poor health conditions [11]. It is necessary to describe the areas in this Meta analytic study which is important to design proper strategies for the future prevention of the disease [12]. Sometimes the meta-analytic studies are conducted on the basis of the school information in order to have an idea about the individuals who can afford what type of education. In 2011, a similar sort of study was conducted by Seckeler et al. in which they specifically discussed the cardiac auscultation's specificity and sensitivity in terms of echocardiography. The study also involves the diagnosis and assessments of cardiac auscultation [13]. Another study conducted by Sani et al. discussed that the rheumatic heart disease is dominant in the children as compared to the old aged people. Although even in that study the researchers did not document the prevalence on the basis of gender and socioeconomic status. In this study, they discussed prevalence on the basis of schooled population [4]. Rheumatic heart disease's prevalence was observed in the regions with poor socioeconomic conditions, health care system and the literacy rate is very low. It was also found that in the absence of rheumatic heart disease some individuals have the disease in latency.

CONCLUSION

By this study it is concluded that this disease's prevalence is very high in the regions of middle or low income and poor health infrastructure and facilities. However, the disease is better diagnosed and quickly treated in the regions of Pakistan where the people are educated and have awareness about healthcare. However, further research should be conducted to detect rheumatic heart disease at an early stage.

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