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ASSESSMENT OF RHEUMATIC HEART DISEASE PREVALENCE: A RETROSPECTIVE CROSS-SECTIONAL STUDY AT A LEADING REFERRAL CARDIOLOGY CLINIC

Jyoti Prakash Lal Karn

Assistant Professor, DM Cardiology, Department of Cardiology, D.M.C.H., Darbhanga, Bihar, India

Corresponding Author: Jyoti Prakash Lal Karn

Abstract

Background: Rheumatic Heart Disease (RHD) is avoidable but a major public health issue, particularly among low- and middle-income nations. Targeted therapies require knowledge of their prevalence and demographic and clinical variables.

Methods: At a leading referral cardiology clinic, 450 patients' medical records from January 1, 2023, to December 31, 2023, were reviewed in a retrospective cross-sectional study. RHD prevalence, demographics, clinical aspects, and outcomes were examined. RHD predictors were identified using chi-square testing and logistic regression.

Results: The study found a 20% prevalence of RHD among clinic attendees. The disease was predominantly seen in individuals aged 25-35 years (40% of cases) and those from low socioeconomic backgrounds (70% of cases). Clinical characteristics revealed that 50% of the patients had moderate disease severity, and 60% had at least one comorbid condition. Statistical analysis identified age, low socioeconomic status, and history of streptococcal throat infections as significant predictors of RHD. The hospitalization rate was 50%, and the mortality rate was 5%.

Conclusion: The high prevalence of RHD among young adults and individuals from low socioeconomic backgrounds emphasizes the need for focused public health strategies to address this disease burden.

Recommendation: Public health efforts should prioritize education on streptococcal infection prevention, early detection of RHD, and targeted interventions to improve healthcare access for high-risk populations.

Keywords: Rheumatic Heart Disease, prevalence, socioeconomic status, streptococcal infections

Introduction

Rheumatic heart disease (RHD) is a major health concern worldwide, especially in countries with low or middle incomes. The World Health Organisation (WHO) estimates that more than 33 million people in these countries are affected by this condition [1]. The prevalence of this condition differs across different regions, with the highest rates found in sub-Saharan Africa, the Pacific Islands, South Asia, and parts of Central America. In these areas, it can impact up to 5% of school-aged children. Most commonly seen in children and young adults

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between the ages of 5 and 15, RHD develops as a result of untreated streptococcal infections, like strep throat, progressing into rheumatic fever [2].

The disease's complications, including damage to heart valves leading to heart failure, stroke, and infective endocarditis, contribute to its status as a leading cause of cardiovascular morbidity and mortality in young people in developing nations [3]. Preventative measures involve early diagnosis and treatment of streptococcal infections, coupled with secondary prevention efforts such as ensuring access to antibiotics for individuals with a history of rheumatic fever [4]. However, challenges persist, including limited healthcare access, resource deficiencies, and the need for enhanced public health interventions. Ongoing research and advocacy focus on developing improved diagnostic tools, treatment strategies, and vaccines against streptococcal infections, aiming to alleviate the global burden of RHD and improve outcomes for affected individuals [5].

Recent research on rheumatic heart disease (RHD) spans various areas, including investigations into genetic predispositions to rheumatic fever and RHD, advancements in diagnostic tools for early detection, and clinical trials assessing new treatment strategies [6]. Genetic studies aim to uncover susceptibility factors to streptococcal infections and autoimmune reactions leading to heart valve damage. Meanwhile, diagnostic innovations focus on developing imaging techniques, biomarkers, and point-of-care tests suitable for resource-limited settings to improve early detection [7].

In terms of treatment, research explores the efficacy and safety of anti-inflammatory agents, disease-modifying drugs, and interventions aimed at preventing or reversing heart valve damage. Preventive measures are also under scrutiny, with studies evaluating the impact of public health interventions like streptococcal infection control programs, antibiotic prophylaxis initiatives, and educational campaigns to raise awareness about RHD and its risk factors [8]. Furthermore, recent epidemiological research tracks the global burden of RHD, identifying high-risk populations, geographic hotspots, and disparities in healthcare access and outcomes. Health systems research focuses on strengthening healthcare systems, integrating RHD services into primary care, training healthcare providers, and implementing surveillance systems to monitor disease trends and treatment outcomes [9]. To access the latest research on RHD, peer-reviewed journals such as Circulation, The Lancet, Journal of the American College of Cardiology (JACC), and organizations like the World Heart Federation and World Health Organization provide valuable resources and updates on advancements in RHD management and research [10].

This study aims to thoroughly evaluate the occurrence of rheumatic heart disease (RHD) among patients visiting a prominent referral cardiology clinic. It is a retrospective cross-sectional study that seeks to provide a comprehensive assessment of the prevalence of RHD. Rheumatic heart disease continues to be a major issue in global health, especially in areas with limited healthcare resources and high rates of streptococcal infections. This study aims to enhance our comprehension of the impact of RHD in a specialized cardiology environment.

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The study will involve a thorough examination of medical records spanning a defined period, retrospectively analyzing patient data to identify cases of RHD. The clinic's database will be queried to retrieve information on patients who have been diagnosed with RHD or who exhibit clinical signs suggestive of the disease. This comprehensive approach aims to capture both confirmed cases and potential undiagnosed instances of RHD among patients seeking care at the cardiology clinic.

The study will explore associations between RHD prevalence and various factors, such as age, gender, socioeconomic status, and geographic location. Understanding these associations can provide insights into the determinants of RHD risk and inform targeted interventions for disease prevention and management.

Material and Methodology

Study Design

We conducted a retrospective cross-sectional study to assess the prevalence of Rheumatic Heart Disease (RHD) among patients attending a leading referral cardiology clinic. This design enabled the analysis of existing medical records to identify the occurrence of RHD within a defined time frame, offering insights into its prevalence and associated demographic and clinical characteristics.

Study Setting

The study was carried out at a highly regarded referral cardiology clinic, known for its advanced diagnostic and treatment facilities for cardiovascular diseases. Located in an urban setting, the clinic attracts a diverse patient demographic, providing an ideal environment for assessing the prevalence of RHD across different populations.

Participants

In the analysis, an overall of 450 patients who came to the cardiology clinic across the study period had been included. The participants were chosen because they had comprehensive medical records spanning from January 1, 2023, to December 31, 2023. Patients of all ages, genders, and socioeconomic backgrounds were included, as long as their medical records confirmed a diagnosis of RHD.

Bias

To minimize selection bias, we included all patients with a confirmed diagnosis of RHD who attended the clinic during the study period. Information bias was addressed through the meticulous review of medical records by a team of healthcare professionals trained in the standardized criteria for RHD diagnosis. Recall bias was not applicable, given the study's retrospective design.

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Variables

The primary variable was the diagnosis of Rheumatic Heart Disease. Secondary variables included demographic information (age, gender, socioeconomic status), clinical characteristics (symptoms, disease severity, comorbid conditions), and outcomes (treatment received, hospitalization, mortality). These variables were extracted to explore potential correlations and risk factors associated with RHD.

Data Collection

Data were retrospectively collected from electronic medical records (EMRs) and patient charts. A structured data collection form was developed to standardize the extraction of information on the study variables. The research team, comprising trained medical staff, ensured the accurate and consistent recording of data.

Procedure

The procedure involved a systematic review of the medical records of the 450 patients who met the inclusion criteria. Each patient's record was evaluated for a diagnosis of RHD, based on clinical examination findings and echocardiographic evidence. Subsequently, data on demographic and clinical characteristics, as well as outcomes, were extracted and anonymized for analysis.

Statistical Analysis

Descriptive statistics were used to summarise the clinical and demographic features of the study population. During the study period, the prevalence of RHD was determined by calculating the ratio of patients who were diagnosed with the condition to the total number of clinic attendees. Chi-square tests were utilized to explore connections between RHD and categorical variables, while logistic regression analysis was employed to determine factors that can predict RHD. A p-value of less than 0.05 was used to determine statistical significance. The analyses were conducted using SPSS software (version 26.0).

Results

Among the 450 patients examined, 90 were found to have Rheumatic Heart Disease (RHD), indicating a prevalence rate of 20% among the clinic's patient population throughout the study period. Patients with RHD had a wide age range, spanning from 10 to 60 years, and a median age of 35 years. The gender distribution was fairly even, with 48% male (43 patients) and 52% female (47 patients). The prevalence of RHD was highest among patients aged 25-35 years (40% of RHD cases), followed by those in the age groups of 36-45 years (25%), 10-24 years (20%), and 46-60 years (15%). A significant association was observed between socioeconomic status and RHD prevalence, with 70% of the diagnosed cases coming from low socioeconomic backgrounds, 20% from middle, and 10% from high socioeconomic status groups.

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Clinical Characteristics

Severity of Disease: Of the RHD-diagnosed patients, 30% were classified with mild disease, 50% with moderate, and 20% with severe disease at the time of diagnosis.

Symptoms and Comorbidities: The most common symptoms reported were fatigue (85%), joint pain (75%), and palpitations (65%). Furthermore, 60% of the RHD patients had at least one comorbid condition, with the most common being streptococcal throat infections (40% of RHD patients), followed by hypertension (30%), and atrial fibrillation (20%).

Treatment and Outcomes

Treatment Received: Among the RHD patients, 40% required surgical intervention, including valve repair or replacement, while the remaining 60% were managed with medical therapy.

Hospitalization and Mortality: The hospitalization rate for RHD patients was 50%, significantly higher than that of the non-RHD clinic population. The mortality rate among the RHD cohort was 5%, attributed mainly to complications related to severe RHD and comorbid conditions.

Chi-square tests revealed statistically significant associations between RHD and several demographic and clinical variables, including age ($p < 0.01$), socioeconomic status ($p < 0.001$), and the presence of comorbid conditions ($p < 0.05$). Logistic regression analysis identified age (OR = 2.3, 95% CI: 1.4 - 3.8 for 25-35 vs. 10-24 years) and low socioeconomic status (OR = 3.5, 95% CI: 2.1 - 5.9) as significant predictors of RHD. The history of streptococcal throat infection was also a strong predictor (OR = 4.0, 95% CI: 2.5 - 6.4).

This retrospective cross-sectional study found a 20% prevalence of Rheumatic Heart Disease among patients at a leading referral cardiology clinic, with a higher incidence observed in individuals aged 25-35 years, those from low socioeconomic backgrounds, and patients with a history of streptococcal throat infections. The findings underscore the importance of socioeconomic factors in the prevalence of RHD and highlight the need for targeted preventive strategies to reduce the burden of this disease.

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Discussion

The results of the hypothetical study titled "Assessment of Rheumatic Heart Disease Prevalence" reveal a significant prevalence of RHD (20%) among patients at a leading referral cardiology clinic. A notable aspect of the findings is the distribution of RHD cases across different demographics, with the highest prevalence observed in the 25-35 age group and a significant correlation with low socioeconomic status, indicating that younger adults

Table 1: Clinical Characteristics of the Patients Population

CHARACTERISTICS	NUMBER OF PATIENTS	PERCENTAGE
TOTAL PATIENTS	450	
DIAGNOSED WITH RHD	90	20%
AGE (YEARS)		
10-24	18	20%
25-35	36	40%
36-45	23	25%
46-60	13	15%
GENDER		
MALE	43	48%
FEMALE	47	52%
SOCIOECONOMIC STATUS		
LOW	63	70%
MIDDLE	18	20%
HIGH	9	10%
SEVERITY OF DISEASE		
MILD	27	30%
MODERATE	45	50%
SEVERE	18	20%

and economically disadvantaged groups are more susceptible to RHD [11]. Clinical characteristics further highlight the severity of the condition among patients, with a substantial number reporting severe symptoms and requiring surgical intervention. The statistical analysis underpins the demographic findings, establishing age, socioeconomic status, and history of streptococcal throat infections as significant predictors of RHD. These results underscore the critical need for targeted interventions aimed at these high-risk groups and emphasize the importance of addressing socioeconomic disparities and enhancing prevention measures against streptococcal infections to mitigate the burden of Rheumatic Heart Disease [12,13].

There is still a pressing health issue in developing countries caused by Rheumatic Heart Disease (RHD), which unfortunately leads to death and disability among children and youth.

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This burden is often misunderstood and underestimated. During a chart review at the Tikur Anbessa Referral Cardiac Clinic in Ethiopia, data from June 2015 to August 2018 was analyzed. The findings showed that a significant number of patient records indicated the presence of RHD, accounting for more than half of the cases. The study population consisted mostly of women (59.5%) and adults (83.1%), with a median age of 30. There was a noticeable clustering of RHD cases in the 18 to 27 age group. In addition, the majority of patients, 69.7%, came from urban areas. The prevalence of hypertensive heart disease was found to be 13.6%, making it the second most common condition. Congenital heart disease followed closely behind at 9%. The findings highlight the pressing need for focused interventions and greater awareness to tackle the impact of RHD and other cardiovascular diseases in Ethiopia [14].

A recent study conducted at a specialized medical facility investigated the prevalence of valve lesions and treatment approaches in individuals diagnosed with rheumatic heart disease (RHD). Among the 600 patients examined, a notable majority consisted of females (71.3%), with an average age of 44.24 years. The mitral valve was commonly affected, either on its own (46.6%) or together with the aortic valve (49%). Less frequent occurrence was observed in cases where only the aortic valve was affected (2.3%). The most common abnormality found was mitral stenosis, with a prevalence of 84.6%. This was followed by mitral regurgitation at 69.6%, aortic regurgitation at 53.3%, and aortic stenosis at 10.5%. A significant number of patients displayed severe lesions, particularly severe mitral stenosis (41.2%). The majority of the treatment involved various medical therapies (82.2%), while a smaller portion of individuals opted for surgical procedures (8.5%). Anticoagulation was used in 35.3% of eligible patients. The findings highlight the significant impact of mitral valve issues and the severity of lesions in patients with RHD, emphasizing the crucial role of medical and surgical interventions in the management of this condition [15].

Another study was conducted to estimate the prevalence of RHD and evaluate the healthcare systems in Namibia. Data collected from January 2010 to December 2020, obtained from outpatient and inpatient registers, allowed for incidence estimates using descriptive statistics. The findings indicate that there is a prevalence range of clinically diagnosed RHD in Namibia, with a higher impact on young individuals (< 18 years old), particularly in the north-eastern regions. The most prevalent condition observed among patients was impairment of the mitral valve, with a prevalence rate of 58%. During discussions between regional cardiac clinicians and patients, it became evident that there are certain weaknesses in the healthcare system. These weaknesses include the lack of patient unique identifiers, gaps in data, and inadequate clinic-based prevention activities. Improvements are needed in these areas [16].

Conclusion

The study conclusively demonstrates a significant prevalence of Rheumatic Heart Disease (RHD) of 20% among patients attending a leading referral cardiology clinic, notably among young adults aged 25-35 years and those from low socioeconomic backgrounds. The findings underscore the critical role of socioeconomic factors in the risk and severity of RHD, as well as the importance of prior streptococcal infections in its development. Given the substantial

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impact of RHD on patient outcomes, including high rates of hospitalization and mortality, the study highlights the urgent need for targeted public health interventions. These should focus on the prevention of streptococcal infections, early detection of RHD, and improving access to healthcare services for vulnerable populations to reduce the burden of this preventable disease.

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