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# THE IMPACT OF RHEUMATIC AND CARDIOVASCULAR DISEASES ON MATERNAL MORTALITY

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**Abstract:** Cardiovascular diseases, including rheumatic heart disease, are among the leading indirect causes of maternal mortality worldwide. Pregnancy places significant physiological stress on the heart, increasing the risk of complications in women with pre-existing cardiac conditions. This retrospective study analyzed maternal mortality cases from 2018 to 2024 in a tertiary maternity hospital, focusing on women with rheumatic or other cardiovascular diseases. The study found that rheumatic heart disease and other cardiovascular conditions were major contributors to maternal deaths, with common complications including heart failure, arrhythmias, and thromboembolism. Late diagnosis, insufficient monitoring, and inadequate multidisciplinary care were key risk factors for poor outcomes. Early screening, timely management, and coordinated care between obstetricians and cardiologists are essential to reduce maternal mortality related to cardiovascular diseases.

**Keywords:** rheumatic heart disease, cardiovascular diseases, maternal mortality, pregnancy complications, heart failure, arrhythmia, thromboembolism, maternal health

## Introduction

Cardiovascular diseases, particularly rheumatic heart disease, are significant contributors to maternal morbidity and mortality worldwide. According to the World Health Organization, cardiovascular conditions account for approximately 15 to 20 percent of indirect maternal deaths. Pregnancy induces extensive hemodynamic changes, including increased blood volume, cardiac output, and heart rate, which can exacerbate pre-existing cardiac conditions and lead to decompensation.[11]

Rheumatic heart disease often develops from untreated streptococcal infections during childhood and remains prevalent in low- and middle-income countries. Women with rheumatic or congenital heart disease face higher risks of maternal complications, including heart failure, arrhythmias, thromboembolic events, and mortality. Despite advances in obstetric and cardiac care, maternal deaths associated with these conditions continue to occur, frequently due to delayed diagnosis, insufficient monitoring, or inadequate multidisciplinary management.

The purpose of this study is to analyze the prevalence and clinical impact of rheumatic and cardiovascular diseases in maternal mortality cases, evaluate the associated maternal complications,

and identify preventive and management strategies that could improve maternal outcomes. By focusing on early detection, risk assessment, and coordinated care, this study aims to provide insights into reducing maternal deaths caused by cardiovascular conditions.

## Methods

This study was designed as a retrospective clinical analysis to evaluate the impact of rheumatic and other cardiovascular diseases on maternal mortality. The research was conducted at a tertiary-level maternity hospital over the period from 2018 to 2024. Maternal mortality cases with confirmed rheumatic or cardiovascular pathology were included in the study. Cases caused purely by obstetric complications, such as hemorrhage or preeclampsia without underlying heart disease, were excluded to focus specifically on the contribution of cardiac conditions.[10]

During preliminary review of the medical records, a key problem was identified: a disproportionately high number of maternal deaths were associated with late diagnosis of rheumatic or congenital heart disease, as well as inadequate monitoring and management during pregnancy and delivery. To address this problem, the study incorporated analytical components to classify the type and severity of cardiovascular disease, identify complications, and evaluate outcomes.[4]

All cases were classified according to the type of cardiovascular condition, including rheumatic valvular disease, congenital heart defects, cardiomyopathies, and other acquired heart diseases. Severity was assessed based on clinical presentation, New York Heart Association functional class, echocardiographic findings, and presence of complications such as heart failure, arrhythmias, or thromboembolism. The study also examined the timing of complications by trimester to determine the periods of greatest maternal risk.[7]

Data sources included medical records, laboratory results, echocardiography and electrocardiography reports, operative and anesthesia reports, and autopsy findings. Variables analyzed included maternal age, type and severity of cardiovascular disease, gestational age at diagnosis, maternal complications, timing of intervention, and maternal outcomes. Statistical analysis involved descriptive statistics, including percentages and frequencies, and comparative analysis to identify risk factors associated with maternal death.[11]

The study also focused on identifying modifiable factors contributing to maternal mortality, including delayed diagnosis, lack of specialized care, insufficient monitoring during pregnancy and labor, and delayed or inappropriate intervention. By systematically evaluating these factors, the study aimed to propose practical solutions, such as early screening for high-risk women, risk stratification, multidisciplinary care involving obstetricians and cardiologists, and timely therapeutic interventions.[3]

## Results

A total of 50 maternal deaths associated with cardiovascular diseases were analyzed in this study. Rheumatic heart disease was the most common condition, accounting for 40 percent of cases, followed by congenital heart defects at 30 percent. Cardiomyopathies contributed to 20 percent of cases, while other acquired heart diseases accounted for 10 percent. The most frequent maternal complications included heart failure, which was observed in 44 percent of women, arrhythmias in 24 percent,

thromboembolism in 16 percent, and severe cardiac decompensation in 10 percent of cases. A small proportion of women, around 6 percent, experienced maternal death without previously documented severe complications.

Analysis by trimester revealed that the majority of severe maternal complications and deaths occurred during the third trimester, representing 60 to 70 percent of cases, while 20 percent occurred in the second trimester and 10 percent in the first trimester. These findings indicate that the late stages of pregnancy are the most vulnerable periods for women with pre-existing cardiovascular conditions. Delayed diagnosis, inadequate monitoring during pregnancy and labor, and lack of multidisciplinary care were consistently associated with poor maternal outcomes. Conversely, cases in which early cardiac assessment, close monitoring, and coordinated management by obstetricians and cardiologists were implemented showed fewer complications and better survival. Overall, these results demonstrate that rheumatic and other cardiovascular diseases are major contributors to maternal mortality and highlight the importance of early detection, careful monitoring, and integrated care throughout pregnancy.

**Analysis**

The analysis revealed that rheumatic heart disease (40%) and congenital heart defects (30%) were the leading cardiovascular conditions contributing to maternal mortality. These conditions were associated with severe maternal complications, including heart failure, arrhythmias, thromboembolism, and decompensated heart conditions. Heart failure was the most common complication, occurring in 44% of cases, followed by arrhythmias (24%) and thromboembolism (16%). Maternal death without prior complications occurred in 6% of cases, suggesting that even in the absence of significant pre-existing conditions, cardiovascular complications could still lead to fatal outcomes.

Furthermore, the study showed that the majority of complications occurred in the third trimester (60–70%), highlighting the late pregnancy period as the highest-risk time for women with cardiovascular disease. Early detection, appropriate monitoring, and timely intervention were crucial in mitigating the risks associated with these conditions. Cases with better outcomes were often characterized by multidisciplinary care and early cardiac involvement, underlining the importance of collaborative management between obstetricians and cardiologists.

**Discussion**

Cardiovascular diseases, including rheumatic heart disease and congenital heart defects, continue to be major contributors to maternal mortality. This study confirms that heart failure, arrhythmias, and thromboembolism are the most significant complications arising from pre-existing cardiovascular conditions during pregnancy. The third trimester emerged as the period with the highest risk for maternal complications, which aligns with findings from previous studies. Pregnancy-induced physiological changes place additional strain on the cardiovascular system, often exacerbating pre-existing conditions.

One of the key issues identified in this study is the delayed diagnosis of cardiac complications and inadequate management during pregnancy and labor. This delay in care, coupled with a lack of multidisciplinary involvement, significantly increases the risk of severe maternal morbidity and

mortality. While rheumatic heart disease is preventable through early treatment of streptococcal infections, congenital heart defects and other cardiac conditions often require more complex, individualized management strategies.

The study further emphasizes the need for improved screening, monitoring, and early intervention for women with cardiovascular risk factors. By adopting a more proactive approach to cardiac assessment and management during pregnancy, the risks of maternal mortality due to cardiovascular complications can be significantly reduced. Implementing routine screening for cardiovascular diseases in high-risk pregnancies, particularly in the third trimester, could help identify women at greater risk of complications.

## Conclusion

Cardiovascular diseases, particularly rheumatic heart disease and congenital heart defects, are significant contributors to maternal mortality. Women with these conditions are at increased risk of severe complications, including heart failure, arrhythmias, and thromboembolism. The third trimester was identified as the most critical period for complications, with delayed diagnosis and inadequate monitoring often contributing to poor outcomes. Early detection, timely intervention, and multidisciplinary care are essential in reducing maternal mortality related to cardiovascular diseases. Preventive strategies, including routine screening for heart disease, early referral to cardiology specialists, and careful monitoring throughout pregnancy, could significantly improve maternal health outcomes.

In conclusion, addressing cardiovascular conditions in pregnant women through early screening and coordinated care between obstetricians and cardiologists is vital to reduce maternal mortality. These findings underscore the need for improved healthcare protocols, better monitoring systems, and comprehensive care pathways to ensure the health and safety of women with cardiovascular diseases during pregnancy.

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