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ACTING ON COMPLICATIONS IN HEART VALVE REPLACEMENT IN RHEUMATIC FEVER, MINIMIZING RISKS AND GUARANTEEING THE PATIENT'S WELL-BEING: A NARRATIVE REVIEW

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NARRATIVE REVIEW

ABSTRACT

Rheumatic fever is an inflammatory disease that can damage the heart valves, in some cases requiring surgical replacement to restore heart function. However, this intervention is not without its complications. This article reviews the main surgical complications in patients undergoing heart valve replacement due to rheumatic fever. The narrative review included nine articles published between 2016 and 2023, selected from databases such as Google Scholar and VHL. Strict inclusion criteria were applied and the results analyzed were systematized in a database. The findings indicate that patients with rheumatic fever are at greater risk of complications after valve replacement. Infective endocarditis is one of the most frequent complications and can cause heart failure and serious embolisms. In addition, the formation of clots in the replaced valves can lead to strokes and other ischemic complications. Residual valve insufficiency, characterized by the inadequate functioning of the new valve, has also been observed, generating inefficient blood flow and symptoms of heart failure. Arrhythmias are another common complication, aggravated by the increased risk in patients with rheumatic fever. The risk of surgical site infections is significant due to the chronic inflammatory nature of the disease, increasing vulnerability to problems such as endocarditis. Prevention and proper management of complications are essential. Careful patient selection, the use of prophylactic antibiotics and post-operative follow-up play a fundamental role in reducing the risks. In addition, controlling inflammation and preventing recurrences of rheumatic fever are crucial in the long term. Patients with rheumatic fever face significant challenges after heart valve replacement, making strategies for early identification and efficient management of complications essential. Collaboration between specialists is essential to promote better outcomes and improve the quality of life of these patients.

Keywords: arrhythmia; infection; endocarditis; surgical complications.

ATUAÇÃO EM COMPLICAÇÕES NA SUBSTITUIÇÃO DE VALVA CARDÍACA NA FEBRE REUMÁTICA, MINIMIZANDO RISCOS E GARANTINDO O BEM-ESTAR DO PACIENTE : REVISÃO NARRATIVA

RESUMO

A febre reumática é uma doença inflamatória que pode danificar as válvulas cardíacas, exigindo, em alguns casos, a substituição cirúrgica para restaurar a função cardíaca. Contudo, essa intervenção não está isenta de complicações. Este artigo revisa as principais complicações cirúrgicas em pacientes submetidos à troca de válvula cardíaca devido à febre reumática. A revisão narrativa incluiu nove artigos publicados entre 2016 e 2023, selecionados em bases como Google Scholar e BVS. Foram aplicados critérios rigorosos de inclusão, e os resultados analisados foram sistematizados em um banco de dados. Os achados indicam que pacientes com febre reumática apresentam maior risco de complicações após a troca de válvula. A endocardite infecciosa é uma das complicações mais frequentes, podendo causar insuficiência cardíaca e embolias graves. Além disso, a formação de coágulos nas válvulas substituídas pode levar a acidentes vasculares cerebrais e outras complicações isquêmicas. Insuficiência valvar residual, caracterizada pelo funcionamento inadequado da nova válvula, também foi observada, gerando fluxo sanguíneo ineficiente e sintomas de insuficiência cardíaca. Arritmias são outra complicação comum, agravada pelo risco aumentado em pacientes com febre reumática. O risco de infecções no local cirúrgico é significativo devido à natureza inflamatória crônica da doença, aumentando a vulnerabilidade para problemas como a endocardite. A prevenção e o manejo adequado das complicações são essenciais. A seleção criteriosa dos pacientes, o uso de antibióticos profiláticos e o acompanhamento pós-operatório desempenham papel fundamental na redução dos riscos. Além disso, o controle da inflamação e a prevenção de recorrências da febre reumática são cruciais no longo prazo. Pacientes com febre reumática enfrentam desafios significativos após a troca de válvula cardíaca, tornando imprescindíveis estratégias para identificação precoce e gestão eficiente das complicações. A colaboração entre especialistas é essencial para promover melhores desfechos e melhorar a qualidade de vida desses pacientes.

Palavras-Chaves: arritmia; infecção; endocardite; complicações cirúrgicas.

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INTRODUCTION

Rheumatic fever, an inflammatory sequela resulting from streptococcal infections, can trigger a process of rheumatic endocarditis, culminating in the degeneration of heart valves and predisposing to the development of mitral stenosis. This condition is characterized by an inadequate opening of the mitral valve, imposing resistance to blood flow between the left atrium and the left ventricle, which compromises cardiac hemodynamics (KELESOGLU *et al.*, 2022).

Clinically, affected individuals may manifest progressive dyspnea on exertion, intense asthenia and anasarca, substantially compromising their functional capacity and quality of life. Early identification of rheumatic fever, coupled with appropriate therapy, is essential to mitigate the evolution of mitral valve disease, since valve remodeling tends to exacerbate over the years, favoring the emergence of more serious adverse outcomes, such as congestive heart failure and high-risk arrhythmias (LAGOEIRO, 2017).

Rheumatic fever is a complex and impactful medical condition that affects the heart valves, having wide-ranging implications for patients' cardiovascular health (FIGUEIREDO *et al.*, 2019). When heart valves suffer damage as a result of this disease, surgical valve replacement intervention becomes a vital necessity to restore proper heart function (NETO *et al.*, 2021).

Chronic rheumatic heart disease (CRC) represents a major public health challenge, characterized by high morbidity and mortality rates, especially among the paediatric population and young adults in emerging nations. Its incidence is approximately twice as high in females (SANYAHUMBI *et al.*, 2022).

It is estimated that CRC affects more than 30 million individuals every year, resulting in around 300,000 deaths per year (MUTAGAYWA *et al.*, 2020). In addition, rheumatic valve disease is an important predisposing factor for unfavorable clinical outcomes, such as infective endocarditis and atrial fibrillation (AF), conditions strongly associated with the incidence of ischemic cerebrovascular events in the advanced phase of rheumatic heart disease (KIM *et al.*, 2019; DADJO *et al.*, 2021).

Heart valve replacement surgery in patients affected by rheumatic fever offers a



comprehensive, critical and in-depth view of the potential associated complications, as well as the prevention and management strategies needed to optimize clinical outcomes (ASHRAF *et al.*, 2024).

The choice of research topic is motivated by a pressing need to deepen understanding of the implications of rheumatic fever on surgical complications resulting from heart valve replacement. However, this procedure is far from being without its challenges and complications (DA SILVA SANTOS *et al.*, 2020).

This research aims to address issues of significant relevance to both medical practice and the quality of life of affected patients (PIVETTA *et al.*, 2023).

This meticulous selection aims to establish a complete and up-to-date overview of the available information. Our study focuses closely on patients who have been diagnosed with rheumatic fever and have subsequently undergone heart valve replacement procedures. This approach aims to shed intense light on the complex complications that often emerge after this highly relevant surgical procedure (LEMOS *et al.*, 2022).

The intrinsic importance of this study is remarkable, as potentially severe complications directly affect both the quality of life and the health of affected patients. Infective endocarditis, the formation of blood clots, residual valve insufficiency and cardiac arrhythmias are clinical challenges of a critical nature, which require thorough and in-depth investigation (NETO *et al.*, 2021; COVALSKIET *et al.*, 2021).

It is worth noting that the presence of rheumatic fever alone amplifies the risk of surgical site infections, adding an additional layer of complexity to already intricate clinical situations (DA SILVA *et al.*, 2016; DA SILVA SANTOS *et al.*, 2020).

It is therefore imperative to underline the vital role that the prevention and effective management of these complications play in optimizing clinical outcomes and substantially improving the quality of life of affected patients (TRUFELI *et al.*, 2022). (COVALSKIET *et al.*, 2021; TRUFELI *et al.*, 2022).

Our research thus aims to provide a deeper understanding of the intricate issues surrounding heart valve replacement surgery in patients with rheumatic fever, emphasizing the importance of early identification and proper management of complications. Furthermore, it highlights the undeniable need for interdisciplinary



collaboration between healthcare professionals in order to achieve the best possible clinical outcomes and promote a significant advance in medical practice (PIVETTA *et al.*, 2023).

The primary objective of the study in question is to carry out a thorough analysis and document the most frequent surgical complications that arise in patients undergoing this specific surgical intervention, with the aim of providing deeper knowledge and establishing effective prevention and management strategies. The time frame and research parameters of this investigation encompass an extensive survey of clinical studies, case reports and systematic reviews published to date.

METODOLOGIA

This study is a narrative literature review designed to explore the complications associated with heart valve replacement in patients diagnosed with rheumatic fever. The method adopted involved a set of structured procedures, including selecting the research topic, actively searching for academic sources, critically evaluating the materials collected, interpreting the data and, finally, presenting the results achieved. Scientific articles were collected by consulting recognized databases such as Google Scholar and the Virtual Health Library (VHL), using the Descriptors on the health sciences website decs.bvs.br, pertinent to the study, which were: "Arrhythmia", "Infection", "Endocarditis" and "Surgical Complications", and others related to the topic.

The selection of articles followed strict criteria that included the free availability of the texts, their relevance to the topic of study, the pertinence of the content, writing in Portuguese or English, with a publication date between 2016 and 2023.

RESULTADOS E DISCUSSÃO

In addition, in order to guarantee quality and consistency with the research objectives, incomplete texts, works in progress, non-scientific reports, letters to the



editor and investigations that were not directly related to the scope of the study were excluded. The literature selection phase was completed on December, 2024, resulting in the inclusion of a total of 19 sources, which fully met the established criteria. The selected articles were subjected to a detailed qualitative analysis, carefully conducted by the researchers involved in the project.

The results obtained were carefully recorded and organized using the Google Documents® online platform, ensuring precision in the systematization and security in the storage of the information needed to carry out this narrative literature review.

Rheumatic fever is a complex and potentially debilitating inflammatory condition that can affect various systems in the body, with the heart valves being one of the areas most vulnerable to its damaging impacts (FIGUEIREDO *et al.*, 2019). When this insidious disease compromises the heart valves, a series of clinical and medical challenges arise, often making heart valve replacement surgery essential (NETO *et al.*, 2021).

In this scenario, heart valve replacement surgery emerges as a crucial measure to restore the integrity and proper performance of the cardiovascular system (DA SILVA SANTOS *et al.*, 2020).

This surgical intervention aims to correct the damage caused by rheumatic fever, restoring efficient blood circulation and consequently relieving the debilitating symptoms that patients can experience (TRUFELI *et al.*, 2022). However, it is crucial to note that heart valve replacement surgery is not without its complications. Patients undergoing this procedure face a number of challenges, from surgical risk to the post-operative recovery period (NÚÑEZ *et al.*, 2022). Potential complications include infections, blood clots, rejection of the new valve tissue, among others (PIVETTA *et al.*, 2023).

It is essential that healthcare professionals are vigilant and provide close monitoring to minimize these risks and ensure a successful recovery (COVALSKI *et al.*, 2021).

Therefore, rheumatic fever and its implications for heart valves are a striking example of how an inflammatory condition can trigger a complex medical journey, which often culminates in the need for heart valve replacement surgery (LAMAS, 2020).

Although this surgery is a vital option, it is crucial to recognize the challenges and



risks associated with it, so that patients can receive the best possible care throughout the process (LEMOS *et al.*, 2022).

Patients whose heart valves have been damaged due to rheumatic fever face an additional and considerable challenge, as the risk of developing infective endocarditis after valve replacement surgery is increased in this group (FIGUEIREDO *et al.*, 2019). Infective endocarditis is a potentially serious infection of the inner lining of the heart or heart valves, and its occurrence after valve replacement surgery can trigger serious complications, having a significant impact on the patient's health (NETO *et al.*, 2021).

This condition, when not adequately treated, can precipitate heart failure, which places an additional burden on the already weakened heart (NÚÑEZ *et al.*, 2022). In addition, infective endocarditis can give rise to the formation of potentially lethal blood clots (PIVETTA *et al.*, 2023), which can travel to other parts of the body and cause embolisms, posing a considerable risk to the patient's health (COVALSKI *et al.*, 2021).

The vulnerability to such complications underscores the importance of ongoing medical surveillance in patients who have undergone heart valve replacement surgery due to rheumatic fever (DA SILVA *et al.*, 2016). Close monitoring and specific preventive therapy are often necessary to minimize the risk of infective endocarditis and its serious implications, thus ensuring the smoothest and most effective recovery possible for these patients already so challenged by their underlying heart condition (LEMOS *et al.*, 2022).

The formation of blood clots in the new heart valves, as a complication following replacement surgery due to rheumatic fever, is an extremely relevant concern (FIGUEIREDO *et al.*, 2019). These clots, often called thrombi, pose a serious threat to the patient's health (NETO *et al.*, 2021) and can precipitate severe ischemic complications (DA SILVA SANTOS *et al.*, 2020).

Thrombi that form on newly implanted heart valves can be dislodged by the bloodstream and, when they reach the brain, can obstruct a cerebral artery. This results in a cerebrovascular accident (CVA), a condition that often causes permanent damage to the brain (TRUFELI *et al.*, 2022) and can have devastating repercussions on the patient's quality of life (NÚÑEZ *et al.*, 2022).

In addition to stroke, the presence of blood clots on the heart valves can also lead to other ischemic complications, such as heart attacks and obstructions in the



arteries of the circulatory system, compromising the supply of blood and oxygen to different parts of the body (PIVETTA *et al.*, 2023). These complications, in turn, can cause damage to vital organs and increase the risk of death (COVALSKI *et al.*, 2021).

Preventing blood clots from forming on the new heart valves is of paramount importance (DA SILVA *et al.*, 2016). This often involves the use of anticoagulants and careful management of drug therapy to keep blood flowing freely and reduce the risk of ischemic complications (ESTEVES *et al.*, 2018; NÚÑEZ *et al.*, 2022). Regular monitoring by healthcare professionals is essential to identify any signs of blood clots early on and take appropriate preventative measures (LEMOS *et al.*, 2022).

Residual valve insufficiency is a complication that can occur in some patients after heart valve replacement surgery (FIGUEIREDO *et al.*, 2019). The human heart has four valves that ensure the unidirectional flow of blood through the heart chambers: the aortic, pulmonary, mitral and tricuspid valves. When one of these valves has problems, such as stenosis (narrowing) or insufficiency (leakage), valve replacement surgery becomes necessary to restore normal heart function and improve blood flow (NETO *et al.*, 2021).

However, even after replacement surgery, in some cases the new valve may not work properly, resulting in residual valve insufficiency (DA SILVA SANTOS *et al.*, 2020). This means that blood leaks in the opposite direction to where it should flow, leading to inefficient blood flow. This situation can overload the heart and lead to the development of heart failure symptoms such as shortness of breath, fatigue, leg swelling and palpitations (TRUFELI *et al.*, 2022).

The causes of residual valve insufficiency can be diverse, including inadequate choice of prosthesis, errors in surgical technique, post-operative complications, or the degeneration of biological valves over time (NÚÑEZ *et al.*, 2022). The diagnosis is usually made using imaging tests, such as echocardiography, which allow the valve leak to be visualized (PIVETTA *et al.*, 2023).

Cardiac surgery is a complex procedure which, in itself, can cause arrhythmias as a complication (COVALSKI *et al.*, 2021). Arrhythmias are heart rhythm disturbances that can manifest as irregular, faster (tachycardia) or slower (bradycardia) heartbeats, or even as uncoordinated beats. This can happen due to various factors related to surgery,



such as surgical stress, direct manipulation of the heart and changes caused by scarring and inflammation in the organ (NETO *et al.*, 2021).

Patients who have a history of rheumatic fever, an inflammatory disease that affects the heart valves, are at greater risk of developing arrhythmias after valve replacement (LEMOS *et al.*, 2022). Rheumatic fever can cause permanent damage to the heart valves, leading to problems such as stenosis or valve insufficiency, which can contribute to the development of arrhythmias (DA SILVA *et al.*, 2016).

It is therefore essential to closely monitor patients with a history of rheumatic fever after heart valve replacement surgery in order to promptly identify and treat any arrhythmias that may arise as a result of the surgery. Regular cardiac examinations, such as electrocardiograms (ECGs), are key to ensuring the cardiac health of these patients after surgery, allowing for appropriate treatment in the event of arrhythmias (PIVETTA *et al.*, 2023).

Surgical site infection is a complication that can occur after heart valve replacement surgery (LAMAS, 2020). This is an important concern as surgical infections can be potentially serious and have the potential to affect healing and the overall success of the surgery (FIGUEIREDO *et al.*, 2019). Patients who have a history of rheumatic fever are particularly vulnerable to infections (NETO *et al.*, 2021). Rheumatic fever is an inflammatory disease that can damage the heart valves, making them more susceptible to subsequent infections (TRUFELI *et al.*, 2022).

Surgical site infection can occur due to exposure to bacteria during surgery or after the operation, when the patient is recovering. Common symptoms of a surgical infection include fever, swelling, redness, pain at the incision site, pus drainage and, in more severe cases, systemic involvement (NÚÑEZ *et al.*, 2022).

To prevent surgical site infections, strict infection control measures are adopted during surgery, including proper sterilization of instruments and the use of prophylactic antibiotics. However, in patients with rheumatic fever, the risk may be higher due to possible pre-existing valve lesions and a compromised immune system (PIVETTA *et al.*, 2023).

Rheumatic fever, an inflammatory condition that affects the heart valves, often leads to the need for valve replacement surgery. However, this surgery is not without



complications, and patients with a history of rheumatic fever face additional risks (COVALSKI *et al.*, 2021).

CONSIDERAÇÕES FINAIS

Rheumatic fever, an inflammatory condition that affects the heart valves, often culminates in the need for valve replacement surgery. However, it is important to recognize that this surgery, while vital, is not without its challenges and complications, particularly for patients with a history of rheumatic fever.

These patients face additional risks, such as being prone to infective endocarditis, a serious condition with serious implications for heart health, which can trigger heart failure. In addition, the formation of blood clots on the new heart valves is a significant concern, as it can result in strokes and other ischemic complications.

Therefore, continuous medical surveillance, prevention, early diagnosis and appropriate treatment are crucial to ensuring the cardiac health of these patients and improving their quality of life. The complexity of the medical journey that these individuals face after heart valve replacement surgery, coupled with the importance of minimizing risks, makes it imperative for healthcare professionals to commit themselves and the medical community to raise awareness in order to provide the best possible care for these patients.

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