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CHAPTER 5

THERAPEUTIC APPROACHES IN THE MANAGEMENT OF SEPSIS IN PATIENTS WITH INFECTIVE ENDOCARDITIS

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ABSTRACT

Sepsis is a critical medical condition that results from the body's inadequate response to an infection, leading to potentially life-threatening organ dysfunction. This study focuses on the management of sepsis in patients with infective endocarditis, a rare but serious infection that has a high rate of complications and mortality. Analysis of the data from this systematic review indicated that the combination of antimicrobial therapy and surgical interventions can significantly improve clinical outcomes. In addition, early identification of pathogens and appropriate choice of antibiotics have been identified as crucial to the effectiveness of treatment. Collaboration between different medical specialties proved to be essential for effective management, providing a multidisciplinary approach that integrates clinical and surgical care. The results of this review provide valuable insights for clinical practice, underscoring the need for evidence-based protocols to optimize the treatment of sepsis in infective endocarditis and thus improve health outcomes for affected patients.

Keywords: Endocarditis. Sepsis. Therapeutics.

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INTRODUCTION

Sepsis is a serious systemic infection characterized by the presence of microorganisms in the bloodstream, which can lead to multiple organ dysfunctions and, in extreme cases, organ failure. When the amount of bacteria in the bloodstream is significantly elevated, there is an increased risk of developing infective endocarditis, even in individuals with structurally normal heart valves. This condition results from the adhesion of microorganisms to cardiac structures, forming vegetations that can compromise valve function and generate systemic complications (Armstrong, 2024)

Infective endocarditis is a rare disease, but it is associated with a high rate of serious complications, often presenting as a complex syndrome. Despite technological advances and the trend towards early surgical intervention, clinical outcomes, especially mortality, did not show a significant reduction. This suggests the need for a more detailed search for information that can offer new perspectives on the management and treatment of this condition (INCOR, 2023).

The diagnosis of infective endocarditis is challenging, requiring a multidisciplinary approach that includes detailed clinical evaluation, laboratory tests, and imaging. Early and accurate identification of the etiological agent is essential for the appropriate choice of antimicrobial therapy, which should be initiated as soon as possible to reduce mortality associated with the disease (Lima et al., 2024)

The aim of this study is to conduct a systematic review of therapeutic approaches in the management of sepsis in patients with infective endocarditis, focusing on how different treatment strategies impact clinical outcomes. The aim is to identify and analyze surgical interventions and antimicrobial therapy options, evaluating their efficacy and their relationship with mortality and associated complications. In addition, it is intended to investigate the importance of multidisciplinary management and the integration of care in the optimization of treatment, aiming to provide insights that can contribute to better clinical practices and, consequently, to the improvement of outcomes in patients affected by this serious condition. This analysis is intended to serve as a guide for the medical community, highlighting the need for personalized, evidence-based approaches to the management of sepsis associated with infective endocarditis.

METHODOLOGY

The methodology used to carry out this systematic review followed the PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), which aim to ensure transparency and quality in the preparation of systematic reviews and meta-

analyses. These guidelines provide a set of items that guide researchers in conducting and reporting reviews, promoting a critical evaluation of the included studies (Moher et al., 2009). The research question, "In patients with infective endocarditis, how do different therapeutic approaches in sepsis management impact clinical outcomes compared to standard therapeutic approaches?", was structured according to the PICO strategy, which stands for Population, Intervention, Comparison, and Outcome, facilitating the formulation of clinical questions and the identification of relevant evidence (Higgins et al., 2011).

The search for relevant literature was conducted in the PubMed databases, using Health Sciences descriptors (DeCS) such as "Sepsis" and "Endocarditis", combined with the Boolean operator AND, which allowed the location of articles that address both conditions simultaneously. Articles in English, Spanish and Portuguese from the last 5 years were included, ensuring a wide range of publications relevant to the theme.

The inclusion criteria for this systematic review were: primary studies evaluating therapeutic interventions in the management of sepsis in patients with infective endocarditis; articles published in peer-reviewed scientific journals; and studies that provided data on clinical outcomes, such as mortality rates and complications. On the other hand, studies that addressed only literature reviews, unconfirmed cases of infective endocarditis, opinion articles, comments, and case reports that did not present quantitative or qualitative data relevant to the research question were excluded from the analysis. This methodology aims to ensure the inclusion of robust and high-quality evidence that can contribute to the understanding of best practices in the management of sepsis associated with infective endocarditis.

RESULTS

The results of the research were obtained from the analysis of the databases, with emphasis on the sCIELO platform, where 19 articles related to the topic in question were initially found. The search was guided by specific keywords that reflect the nature of research on therapeutic approaches in the management of sepsis in patients with infective endocarditis. After applying year filters, limiting studies to a range from 2020 to 2024, the number of relevant articles was reduced to 17. This initial selection highlights the relevance and timeliness of the research, evidencing an effort to focus on publications that reflect the most recent practices and findings in the field.

In the next stage, a careful analysis of the titles and abstracts of the 17 selected studies was carried out. During this evaluation, 10 articles were excluded. The reasons for this exclusion were diverse, including the lack of relevance to the topic addressed, the

duplication of studies already considered, and the non-compliance with the inclusion criteria established for this systematic review. This rigorous screening process was essential to ensure that only the most relevant and quality articles were considered, reflecting the intention to provide a robust and informative analysis on the impact of therapeutic interventions on sepsis associated with endocarditis.

After the complete reading of the remaining nine texts, only seven articles proved to be adequate to answer the research question formulated. These seven studies, after detailed analysis, addressed different aspects of therapeutic interventions, including the comparison between surgical and non-surgical treatments, the efficacy of antimicrobial regimens, and the importance of multidisciplinary management in optimizing clinical outcomes. The inclusion of these articles represents a significant contribution to the understanding of the topic, providing a comprehensive view of current practices in the management of sepsis in patients with infective endocarditis.

DISCUSSION

The comparison between different therapeutic approaches in the management of sepsis in patients with infective endocarditis is central to the understanding of clinical outcomes. The data demonstrate that patients who underwent surgical interventions had a significantly lower mortality rate compared to those who received only antimicrobial treatment. This evidence suggests that the surgical approach, especially in cases with neurological complications, can improve clinical outcomes, corroborating the trend observed in several publications in the area. Surgery has been shown to be effective in reducing mortality, especially in patients who faced hemodynamic deterioration or persistent infection (Correia et al., 2024)

Early identification of infectious agents through blood cultures and the use of echocardiography are essential for appropriate management, allowing the differentiation between the types of endocarditis and the choice of the most appropriate therapy. Antibiotic administration should be adjusted to the identified microorganism, which improves survival rates and decreases mortality associated with sepsis (Barbosa et al., 2023)

In addition, the article emphasizes the importance of emerging bacterial resistance as a critical challenge in the treatment of infective endocarditis. The need for prolonged antimicrobial therapy and monitoring of antibiotic levels are critical to ensure complete eradication of the infection. The development of new antibiotic combinations and the implementation of personalized therapies are indicated as promising areas to improve clinical outcomes. Evidence suggests that while standard approaches are essential, the

integration of surgical strategies and active management of bacterial resistance may lead to more favorable clinical outcomes compared to conventional therapeutic approaches (Lima et al., 2024).

The mortality rate observed in patients undergoing surgery was lower compared to those who received antimicrobial treatment alone. This indicates that, in situations where there are neurological complications or hemodynamic deterioration, surgical intervention may be crucial to improve clinical outcomes (Barbosa et al., 2023). Early surgical intervention, especially in patients with complications such as congestive heart failure or abscesses, has been shown to improve clinical outcomes. Perioperative mortality ranged between 5% and 15%, depending on factors such as the severity of the infection and the hemodynamic condition of the patient (Fortes and Fortes, 2021).

In addition, the presence of comorbidities, such as diabetes and HIV infection, was identified as a predictor of complications and mortality, emphasizing the importance of individualized management. The absence of fever at clinical presentation has been related to a delay in diagnosis, which may prolong the time to initiation of appropriate therapy, thereby increasing the risk of cerebral embolization. This information underlines the need for more agile care focused on strategies that integrate both clinical and surgical treatment, depending on the patient's condition. In summary, the management of sepsis in patients with infective endocarditis requires a multidisciplinary approach and evidence-based decision-making, considering the specificities of each case to optimize clinical outcomes (Barbosa et al., 2023).

The implementation of a multidisciplinary approach is pointed out as a critical aspect in the management of infective endocarditis. Guidelines from the European Society of Cardiology (ESC) and the American Heart Association (AHA) emphasize the importance of a collaborative team that includes cardiologists, infectious disease specialists, and surgeons. This collaboration is essential for optimizing sepsis management and minimizing complications, as effective communication between team members is crucial to ensure that all aspects of patient care are adequately addressed. Research suggests that by integrating different specialties into treatment, clinical outcomes can be significantly improved, confirming that multidisciplinary therapeutic approaches can have a positive impact on mortality and morbidity associated with infective endocarditis (Mourad et al., 2023, Otto et al., 2020).

CONCLUSION

The systematic review of therapeutic approaches in the management of sepsis in patients with infective endocarditis highlighted the complexity and severity of this condition, in addition to highlighting the importance of appropriate interventions to improve clinical outcomes. The data analyzed suggest that the combination of effective antimicrobial therapy and surgical interventions when indicated is crucial to reduce mortality and associated complications. The articles included in the review demonstrated that, despite advances in diagnosis and treatment, mortality is still high, especially in patients with significant comorbidities. Therefore, early identification of pathogens and careful selection of antibiotics, as well as continuous evaluation of the patient's clinical conditions, are essential to optimize the therapeutic response.

In addition, the analysis of the studies highlighted the need for a multidisciplinary approach, involving cardiologists, infectious disease specialists, surgeons, and other specialists. This collaboration is critical to ensuring that every aspect of patient management is addressed, from clinical management to necessary surgical interventions. The evidence collected in this systematic review can serve as a guide for clinical practice, proposing the development of treatment protocols that integrate evidence-based strategies, aiming to improve the quality of care and health outcomes of patients with infective endocarditis. Continued research in this area is necessary to deepen the understanding of the efficacy of different interventions and to explore new approaches that may emerge, thus contributing to the reduction of mortality and the improvement of the quality of life of these patients.

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