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CLINICAL COURSE AND COMPLICATIONS OF GROUP A B-HEMOLYTIC STREPTOCOCCAL INFECTION IN CHILDREN

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Abstract: Group A β-hemolytic streptococcal infection remains one of the most common bacterial diseases in childhood and continues to pose a significant clinical challenge due to its diverse manifestations and potential for serious complications. This article aims to analyze the clinical course of Group A β-hemolytic streptococcal infections in children, with particular attention to age-related features, severity of symptoms, and the development of early and late complications. Special emphasis is placed on the diagnostic difficulties associated with atypical presentations and the role of timely antimicrobial therapy in preventing post-streptococcal sequelae. The findings highlight the importance of early recognition, appropriate laboratory confirmation, and rational treatment strategies to reduce morbidity and long-term outcomes in pediatric patients.

Keywords: Group A β-hemolytic streptococcus; pediatric infections; clinical manifestations; post-streptococcal complications; early diagnosis; antimicrobial therapy

Introduction

Group A β-hemolytic streptococcus (GAS) is a leading cause of bacterial infections in the pediatric population worldwide. It is responsible for a wide spectrum of clinical conditions, ranging from mild upper respiratory tract infections to severe invasive diseases. Despite advances in diagnostic methods and antimicrobial therapy, GAS infections remain highly prevalent among children and continue to be associated with significant morbidity. In childhood, the clinical presentation of Group A β-hemolytic streptococcal infection often varies depending on age, immune status, and the presence of concomitant diseases. While acute pharyngitis and tonsillitis are the most commonly recognized manifestations, GAS can also cause skin and soft tissue infections, scarlet fever, and, in rare cases, life-threatening systemic involvement. The nonspecific nature of early symptoms frequently leads to delayed diagnosis and inappropriate treatment. One of the most important aspects of GAS infection is its potential to cause immune-mediated complications, including acute rheumatic fever, post-streptococcal glomerulonephritis, and reactive arthritis. These complications may develop even after the resolution of the primary infection, emphasizing the critical role of early detection and adequate antibiotic therapy. In many cases, insufficient awareness of these risks contributes to underestimation of the disease severity. Given the ongoing clinical relevance of Group A β-hemolytic streptococcal infections in children, a detailed evaluation of their clinical course and associated complications is essential. Understanding the patterns of disease progression and identifying key factors influencing outcomes may contribute to improved diagnostic accuracy, timely treatment, and effective prevention of long-term sequelae in pediatric patients.

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Materials and Methods

This study was conducted as an observational clinical analysis of pediatric patients diagnosed with Group A β-hemolytic streptococcal infection. The research was carried out at the clinical bases of the Termiz Branch of Tashkent State Medical University over a defined study period. Children who presented with symptoms suggestive of streptococcal infection were included in the study after clinical and laboratory evaluation. The study population consisted of children aged 3 to 15 years. Inclusion criteria comprised the presence of acute onset of sore throat, fever, tonsillar exudates, cervical lymphadenopathy, or characteristic skin manifestations, along with laboratory confirmation of Group A β-hemolytic streptococcus. Patients with chronic systemic diseases, immunodeficiency, or recent antibiotic use were excluded to ensure the reliability of clinical assessment. Clinical examination was performed for all patients, with documentation of general condition, body temperature, oropharyngeal findings, skin involvement, and signs of systemic toxicity. Laboratory investigations included throat swab culture on blood agar, rapid antigen detection tests for streptococcus, complete blood count, and inflammatory markers such as C-reactive protein and erythrocyte sedimentation rate. Patients received standard antimicrobial therapy in accordance with current clinical guidelines. The choice of antibiotic, duration of treatment, and patient response were recorded. Follow-up assessments were conducted to monitor clinical improvement and to identify early or late complications, including acute rheumatic fever and post-streptococcal glomerulonephritis. Collected data were analyzed using descriptive statistical methods. Clinical features, laboratory findings, and the frequency of complications were evaluated to determine patterns in the clinical course of Group A β-hemolytic streptococcal infection in children.

Results

The study included pediatric patients aged 3–15 years with laboratory-confirmed Group A β-hemolytic streptococcal infection. The majority of cases were observed in school-aged children, with a higher incidence noted among patients between 6 and 12 years. No significant gender-related differences in disease occurrence were identified. Clinically, acute streptococcal pharyngitis was the most common presentation. Most children presented with sudden onset of fever, sore throat, and general malaise. Tonsillar hyperemia and exudative changes were frequently observed, accompanied by tender anterior cervical lymphadenopathy. A subset of patients developed scarlet fever–like manifestations, characterized by a fine erythematous rash and “strawberry tongue.” Laboratory findings demonstrated elevated inflammatory markers in the majority of patients. Leukocytosis with neutrophil predominance and increased C-reactive protein levels were commonly detected. Throat swab cultures and rapid antigen detection tests confirmed the presence of Group A β-hemolytic streptococcus in all enrolled cases, validating the clinical diagnosis. Following initiation of appropriate antimicrobial therapy, most patients showed significant clinical improvement within 48–72 hours. Fever subsided, throat pain decreased, and general condition improved. However, delayed presentation or incomplete adherence to treatment was associated with a prolonged disease course in a small number of cases. Complications were identified in a limited proportion of patients. Early complications included peritonsillar inflammation and cervical lymphadenitis. Late immune-mediated complications, such as acute rheumatic fever and post-streptococcal glomerulonephritis, were observed predominantly in children who received delayed or inadequate antibiotic therapy. These findings underscore the importance of timely diagnosis and effective management in preventing adverse outcomes.

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Discussion

The results of this study confirm that Group A β-hemolytic streptococcal infection remains a significant cause of acute illness in the pediatric population, particularly among school-aged children. The predominance of pharyngeal involvement observed in this research is consistent with the well-documented tendency of this pathogen to colonize and infect the upper respiratory tract. The absence of marked gender differences suggests that susceptibility is more closely related to age and exposure than to biological sex. The clinical manifestations identified in this study demonstrate the polymorphic nature of streptococcal infections in children. While classic symptoms such as fever, sore throat, and tonsillar exudates were common, the presence of scarlet fever–like features in some patients highlights the toxin-mediated effects of Group A streptococcus. These findings emphasize the importance of careful clinical assessment, as atypical or mild presentations may lead to underdiagnosis. Laboratory results supported the clinical diagnosis and reflected an active inflammatory response. Elevated leukocyte counts and inflammatory markers were frequently observed, underscoring their value as supportive diagnostic tools. Nevertheless, microbiological confirmation through throat culture or rapid antigen testing remains essential for accurate diagnosis and appropriate antimicrobial selection. A key finding of this study is the clear association between delayed or inadequate treatment and the development of complications. Early complications, such as regional lymphadenitis, were more likely to occur in patients with prolonged disease course, whereas late immune-mediated complications were primarily identified in children who did not receive timely antibiotic therapy. This observation reinforces the concept that many post-streptococcal sequelae are preventable through early intervention. Overall, the findings highlight the critical role of early recognition, laboratory confirmation, and adherence to recommended treatment protocols in the management of Group A β-hemolytic streptococcal infection in children. Increased awareness among healthcare providers and caregivers may contribute to improved outcomes and reduction of long-term complications associated with this common yet potentially serious infection.

Conclusion

Group A β-hemolytic streptococcal infection remains a common and clinically important disease in the pediatric population. The findings of this study demonstrate that the clinical course in children is often acute and predominantly involves the upper respiratory tract, with manifestations that may vary in severity. Timely diagnosis supported by laboratory confirmation plays a crucial role in ensuring appropriate management. The results also indicate that early initiation of adequate antimicrobial therapy leads to rapid clinical improvement and significantly reduces the risk of both early and late complications. In contrast, delayed treatment or poor adherence to therapy increases the likelihood of immune-mediated sequelae, which may result in long-term health consequences. Therefore, strengthening early diagnostic strategies, improving awareness of clinical features, and ensuring strict compliance with treatment guidelines are essential steps in reducing morbidity associated with Group A β-hemolytic streptococcal infections in children. Continued clinical observation and follow-up are recommended to prevent and promptly identify potential complications.

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