



CLINICAL PROFILE AND OUTCOMES OF PYOGENIC MENINGITIS IN PEDIATRIC PATIENTS

Dr. Nikhil Mahajan

Assistant Professor, Department of Paediatrics S.M.B.T. Institute of Medical Sciences & Research Center, Dhamangaon, Dist. Nashik

ARTICLE INFO

Research Article

Received 17 October 2016

Accepted 15 December 2016

Corresponding Author:

Dr. Nikhil Mahajan

Assistant Professor, Department of Paediatrics S.M.B.T. Institute of Medical Sciences & Research Center, Dhamangaon, Dist. Nashik

ABSTRACT

BACKGROUND:

Background: Pyogenic meningitis is a significant health concern in the pediatric population, leading to high morbidity and mortality rates. Early diagnosis and effective treatment are crucial for improving outcomes in affected children. This study aims to assess the clinical profile of pyogenic meningitis in pediatric patients and evaluate the outcomes.

Objective: To analyze the clinical presentation, laboratory findings, and outcomes of pyogenic meningitis in children.

Material and Methods: This study was conducted in the Department of Pediatrics at a tertiary care hospital. A total of 60 pediatric patients diagnosed with pyogenic meningitis were included in the study. Data were collected regarding clinical features, laboratory results, treatment regimens, and outcomes.

Results: The study found that the most common presenting symptoms were fever (83.3%), irritability (78.3%), and vomiting (65.0%). The most frequently isolated organisms were *Streptococcus pneumoniae* (45%) and *Neisseria meningitidis* (30%). The overall mortality rate was 10%, while 60% of patients had good recovery without neurological deficits.

Conclusion: The clinical profile of pyogenic meningitis in the pediatric age group is characterized by fever, irritability, and vomiting. Early diagnosis and appropriate antibiotic therapy significantly improve outcomes, emphasizing the need for prompt medical intervention.

Keywords: Pyogenic meningitis, Pediatric, Clinical profile, Outcomes, Antibiotic therapy

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INTRODUCTION

Pyogenic meningitis, an inflammation of the protective membranes covering the brain and spinal cord, remains a critical health issue in children worldwide. The condition is primarily caused by bacterial infections, leading to significant morbidity and mortality in the pediatric population (1). Despite advancements in medical science, the incidence of pyogenic meningitis continues to pose challenges,

particularly in developing countries, where access to healthcare may be limited (2).

Children are particularly vulnerable to infections due to their developing immune systems. Pyogenic meningitis is associated with various pathogens, with *Streptococcus pneumoniae* and *Neisseria meningitidis* being the most common culprits in the pediatric age group (3). The clinical manifestations of meningitis can vary significantly, but common symptoms include fever, irritability, vomiting, and signs of

meningeal irritation such as nuchal rigidity (4). Timely recognition and treatment are essential to reduce the risk of long-term complications, including neurological deficits and death (5).

Diagnosis is primarily based on clinical evaluation and cerebrospinal fluid (CSF) analysis, with lumbar puncture being the gold standard (6). CSF findings typically show an elevated white blood cell count with a predominance of neutrophils, increased protein levels, and decreased glucose levels compared to serum (7). Prompt initiation of appropriate antibiotic therapy can lead to favorable outcomes; however, delays in treatment can significantly worsen prognosis (8).

The present study aims to evaluate the clinical profile of pyogenic meningitis in pediatric patients and assess the outcomes following treatment. By analyzing the common clinical features, laboratory findings, and treatment responses, this study seeks to enhance understanding of the disease and improve management strategies in pediatric settings.

Aim and Objectives

Aim: To evaluate the clinical profile and outcomes of pyogenic meningitis in pediatric patients.

Objectives:

1. To assess the clinical presentation and laboratory findings in children with pyogenic meningitis.
2. To analyze the treatment regimens and outcomes of these patients.

Material and Methods

This observational study was conducted in the Department of Pediatrics at a tertiary care hospital over a period of six months. A total of 60 pediatric patients diagnosed with pyogenic meningitis were included based on clinical criteria and CSF analysis.

Inclusion Criteria:

- Children aged 1 month to 14 years with a diagnosis of pyogenic meningitis based on clinical presentation and CSF analysis.

Exclusion Criteria:

- Patients with viral meningitis, fungal meningitis, or previous neurological disorders.

Data were collected from medical records and included demographic information, clinical features, laboratory results, treatment modalities, and outcomes. Clinical features assessed included fever, irritability, vomiting, seizures, and signs of meningeal irritation. CSF analysis was performed to identify the causative organism, and blood cultures were also obtained.

Patients received standard treatment protocols, including intravenous antibiotics based on local guidelines. Outcomes were assessed based on recovery status, neurological deficits, and mortality.

Statistical analysis was performed using SPSS software, and descriptive statistics were calculated for demographic and clinical variables.

Results

Table 1: Clinical Characteristics of Pediatric Patients with Pyogenic Meningitis

Clinical Feature	Number of Patients (n=60)	Percentage (%)
Fever	50	83.3
Irritability	47	78.3
Vomiting	39	65.0
Seizures	20	33.3
Neck Stiffness	25	41.7
Photophobia	18	30.0

Table 2: Microbiological Profile of Causative Organisms

Organism	Number of Isolates (n=60)	Percentage (%)
<i>Streptococcus pneumoniae</i>	27	45.0
<i>Neisseria meningitidis</i>	18	30.0
<i>Haemophilus influenzae</i>	8	13.3
<i>Escherichia coli</i>	4	6.7
No growth	3	5.0

The study included 60 pediatric patients diagnosed with pyogenic meningitis. The demographic characteristics revealed that the majority of patients were under the age of 5 years (65%), with a slight male predominance (56.7%). The most common presenting symptoms were fever (83.3%), irritability (78.3%), and vomiting (65.0%). Seizures were reported in 33.3% of patients, and 41.7% showed signs of neck stiffness.

Microbiological evaluation revealed *Streptococcus pneumoniae* as the most commonly isolated organism (45%), followed by *Neisseria meningitidis* (30%) and *Haemophilus influenzae* (13.3%). In 5% of cases, no organism was identified.

The overall mortality rate in this study was 10%, with 6 patients succumbing to the illness. Of the surviving patients, 60% had good recovery without neurological deficits, while 30% showed mild deficits, and 10% had significant complications.

Discussion

The findings from this study highlight the significant clinical profile and outcomes of pyogenic meningitis in the pediatric population. The most prevalent symptoms, including fever, irritability, and vomiting, are consistent with existing literature that emphasizes the acute presentation of meningitis (9). This study corroborates the notion that early recognition of these symptoms is critical for prompt diagnosis and treatment.

The predominance of *Streptococcus pneum - oniae* as the leading causative organism aligns with global trends in bacterial meningitis, reflecting its role as a major pathogen in children (10). The high isolation rate of *Neisseria meningitidis* also emphasizes the importance of vaccination programs targeting these pathogens, as they remain significant contributors to morbidity in the pediatric age group (11).

The mortality rate observed in this study (10%) is consistent with previous studies, highlighting the ongoing risk associated with pyogenic meningitis despite advances in treatment (12). Early initiation of appropriate antibiotics is crucial for improving outcomes and reducing the risk of complications (13).

Neurological deficits in surviving patients underscore the need for continued monitoring and follow-up care. Research indicates that early intervention and supportive care can mitigate long-term consequences, such as developmental delays and cognitive impairments (14).

The results of this study advocate for the importance of vaccination, public awareness, and healthcare access to reduce the incidence and impact of pyogenic meningitis in children. Furthermore, continuous education and training of healthcare professionals are essential to ensure prompt recognition and management of this serious condition (15).

Conclusion

This study highlights the clinical profile of pyogenic meningitis in the pediatric age group, characterized by fever, irritability, and vomiting. The outcomes reflect the importance of early diagnosis and appropriate antibiotic therapy in reducing mortality and morbidity. Continuous efforts are needed to improve vaccination coverage and raise awareness to mitigate the impact of pyogenic meningitis on child health.

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