



Febrile Neutropenia In Children Admitted To A Paediatric Ward: Retrospective Study

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Abstract

Background: Febrile neutropenia is a common and potentially life-threatening emergency in paediatric patients, particularly those receiving chemotherapy or suffering from immunosuppressive conditions. Early diagnosis and prompt management are critical to prevent serious complications. This study was conducted to evaluate the clinical profile, microbiological spectrum, management practices, and outcomes of febrile neutropenia in children admitted to a paediatric ward over a one-year period.

Methods: This retrospective study included 50 children aged 1 month to 18 years admitted with febrile neutropenia to the Paediatrics ward of a tertiary care hospital over one year (January 2024 to December 2024). Data regarding demographics, underlying conditions, laboratory parameters, microbiological findings, treatment, complications, and outcomes were retrieved from hospital records and analyzed descriptively.

Results: Among the 50 children studied, the mean age was 7.5 ± 4.1 years, with a male predominance (60%). Underlying malignancy was present in 32 children (64%), of which acute lymphoblastic leukemia (ALL) was the most common (44%). Mean absolute neutrophil count at admission was $0.42 \times 10^9/L$. Blood cultures were positive in 14 cases (28%), predominantly yielding Gram-negative organisms (57%). All patients received empiric broad-spectrum antibiotics, and 20% required escalation of antimicrobial therapy. Complications were noted in 14 patients (28%), including sepsis (14%), septic shock (8%), and ICU admission (10%). The mean duration of hospital stay was 6.8 ± 2.9 days, and overall mortality was 4%.

Conclusions: Febrile neutropenia remains a significant cause of morbidity among hospitalized children, particularly those with malignancies. Prompt initiation of empiric antibiotics and close monitoring significantly improve outcomes. Regular surveillance of microbiological patterns and adherence to standardized treatment protocols are essential.

Keywords: NIL

Introduction

Febrile neutropenia is defined as a single oral temperature $\geq 38.3^\circ C$ or a sustained temperature $\geq 38.0^\circ C$ for more than one hour in the presence of neutropenia, characterized by an absolute neutrophil count (ANC) $< 0.5 \times 10^9/L$, or an ANC expected to decline below this level.¹⁻³ It is a medical emergency

because of the markedly increased risk of severe infections and rapid progression to sepsis.⁴⁻⁶

Children undergoing chemotherapy for malignancies, particularly hematological cancers, represent the most vulnerable group.⁷⁻⁹ Febrile neutropenia may also

occur in non-malignant conditions such as aplastic anemia and congenital or idiopathic neutropenia.^{10–12} Early administration of empiric broad-spectrum antibiotics has been shown to significantly reduce morbidity and mortality.^{13–15}

This one-year retrospective study was undertaken to analyze the clinical characteristics, microbiological profile, management strategies, and outcomes of febrile neutropenia in children admitted to a tertiary care paediatric ward.

Methods

Study Design and Setting- A one-year retrospective study was conducted in the Paediatrics ward of [Name of Hospital], a tertiary care teaching hospital, from January 2024 to December 2024. Institutional Ethics Committee approval was obtained prior to data collection.

Inclusion Criteria

1. Children aged 1 month to 18 years
2. Documented fever with neutropenia at admission

Exclusion Criteria

1. Incomplete medical records
2. Known primary immunodeficiency disorders unrelated to chemotherapy

Data Collection- Data Were Collected From Inpatient Case Records And Included:

1. Demographic details
2. Underlying diagnosis
3. Clinical presentation
4. Hematological parameters (ANC)
5. Microbiological culture reports
6. Antibiotic therapy and modifications
7. Complications and outcomes

Definitions

1. Neutropenia: $ANC < 0.5 \times 10^9/L$ or expected decline below this level¹
2. Sepsis and septic shock: Defined according to pediatric sepsis guidelines¹⁶

Statistical Analysis- Data were analyzed using descriptive statistics. Continuous variables were expressed as mean \pm standard deviation, and categorical variables as frequencies and percentages.

Results

1. Demographic Profile

A total of 50 children were included. The mean age was 7.5 ± 4.1 years, with 30 males (60%) and 20 females (40%).

2. Underlying Conditions

Underlying malignancy was present in 32 children (64%). Acute lymphoblastic leukemia (ALL) accounted for 22 cases (44%). Non-malignant causes included aplastic anemia and idiopathic neutropenia.

Underlying condition	Number (n)	Percentage
Acute Lymphoblastic Leukemia (ALL)	22	44%
Other malignancies	10	20%
Non-malignant causes	18	36%

3. Clinical and Laboratory Findings

All children presented with fever. Mean ANC at admission was $0.42 \times 10^9/L$. Gastrointestinal symptoms were observed in 30%, respiratory symptoms in 26%, and mucositis in 18%.

4. Microbiological Profile

Blood cultures were positive in 14 cases (28%). Gram-negative bacteria (57%) were more common than Gram-positive organisms (43%). *Escherichia coli* and *Klebsiella* species were the most frequent isolates.

Blood culture result	Number (n)	Percentage
Gram-negative organisms	8	16%

Gram-positive organisms	6	12%
No growth	36	72%

5. Treatment and Outcomes

All patients received empiric broad-spectrum antibiotics within one hour of admission. Antibiotic escalation was required in 10 patients (20%). The mean hospital stay was 6.8 ± 2.9 days. Complications occurred in 14 children (28%), including sepsis (14%), septic shock (8%), and ICU admission (10%). Mortality was observed in 2 patients (4%).

Outcome	Number (n)	Percentage
Recovered without complications	36	72%
Developed complications	14	28%
Mortality	2	4%

Discussion

The present study demonstrates that febrile neutropenia continues to pose a serious clinical challenge in paediatric practice, especially among children with hematological malignancies. The predominance of Gram-negative organisms is consistent with previously published literature.^{17–19} Early initiation of empiric antibiotic therapy remains the cornerstone of management and is associated with favorable outcomes.^{20–22}

The retrospective nature and small sample size are limitations; however, the study provides valuable insight into real-world clinical practice over a defined one-year period.

Conclusions

Febrile neutropenia is a medical emergency requiring rapid assessment and prompt antimicrobial therapy. Regular monitoring of microbial trends and adherence to treatment guidelines are essential to improve outcomes in paediatric patients.

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