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RECENT CHANGES IN THE CLINICAL SYMPTOMATOLOGY OF COMMUNITY-ACQUIRED PNEUMONIA IN CHILDREN

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ABSTRACT

Background: Community-acquired pneumonia (CAP) is still one of the most prevalent reasons for kids to go to the hospital. The clinical manifestation of juvenile community-acquired pneumonia seems to be altering due to extensive immunization, enhanced nutrition, and shifting respiratory pathogen patterns. Classical symptoms like high fever and chest indrawing may not be as common now. Instead, more cases are being recorded with wheezing and viral-like symptoms. The objectives is to assess the present clinical symptomatology, severity indicators, and outcomes of community-acquired pneumonia in children admitted during a recent one-year timeframe.

Materials and Methods: This retrospective observational study encompassed 100 children aged 1 month to 12 years, admitted with CAP from February 2025 to January 2026 at a tertiary care hospital. We looked at demographic information, symptoms, clinical indicators, oxygen saturation, laboratory results, radiographic findings, treatment, and outcomes.

Results: Fever (93%) and cough (92%) were the most common symptoms that people had. 76% of the cases had tachypnea, although only twenty-four percent had chest indrawing. Wheezing was observed in 27% of children, suggesting an increasing wheeze-associated pneumonia phenotype. In 29% of cases, hypoxia (SpO_2 <92%) happened. 12% of patients had complicated pneumonia, and nine percent needed intensive care. Viral or unusual causes were suspected in over half of the cases based on clinical characteristics and lab results.

Conclusion: The clinical manifestation of pediatric CAP is evolving towards diminished classical bacterial characteristics and an increased prevalence of wheeze-dominant and viral-like symptoms. These findings underscore the necessity to modify diagnostic and therapeutic strategies to align with current disease trends, thereby preventing overtreatment while facilitating the prompt recognition of severe cases.

Keywords: Community-acquired pneumonia; pediatric population; clinical manifestations; wheezing; hypoxia; pediatric respiratory diseases.

INTRODUCTION

Community-acquired pneumonia (CAP) is a predominant cause of morbidity and hospitalization in children globally, especially in low- and middle-income nations.[1] Pneumonia is still a major cause of death in children under five and hospitalizations in children, even though immunization programs have become better, cleanliness has gotten better, and access to healthcare has gotten better.[2]

In the past, pediatric CAP was clinically defined by fever, cough, tachypnea, chest indrawing, and specific auscultatory abnormalities such crackles or bronchial breath sounds.[3] These characteristics became the basis of World Health Organization (WHO) case classifications and community-based management algorithms.[4] Nonetheless, mounting evidence indicates that the clinical range of CAP in children is undergoing evolution.

The extensive implementation of combination vaccines targeting Streptococcus pneumoniae and Haemophilus influenzae type b has significantly diminished invasive bacterial pneumonia.[5] At the same time, respiratory viruses and unusual bacteria such Mycoplasma pneumoniae have become the main causes of pediatric CAP.[6] These pathogens frequently manifest with wheezing, rhinorrhea, and less severe systemic symptoms, obscuring the differentiation between pneumonia, bronchiolitis, and asthma-related lower respiratory tract infections.[7]

Recent clinical observations show that traditional symptoms such chest indrawing and lobar consolidation are becoming less common, while pneumonia linked to wheezing and mixed viral-bacterial presentations are becoming more common.[8] These modifications bear significant consequences for diagnosis, antibiotic stewardship, and triage decisions, particularly in resource-constrained environments where clinical diagnosis is the fundamental aspect of care.

This study aimed to delineate the current clinical symptomatology of community-acquired pneumonia in children admitted over a recent one-year period (February 2025 – January 2026) and to evaluate severity patterns and outcomes in modern clinical practice.

Objectives

1. To describe the presenting symptoms and clinical signs of community-acquired pneumonia in children.
2. To assess indicators of illness severity, encompassing hypoxia, sequelae, and the necessity for intensive care unit admission.
3. To find new trends that point to changes in the causes of pediatric CAP.

MATERIALS AND METHODS

Design and location of the study: A retrospective observational study was performed at a tertiary care pediatric hospital.

Study period: From February 2025 to January 2026.

Population of the study: During the study period, children between the ages of 1 month and 12 years were admitted with a diagnosis of community-acquired pneumonia.

Sample size: A total of 100 children who met the requirements for inclusion were included.

Criteria for inclusion From 1 month to 12 years old • A sudden cough and/or trouble breathing

- A clinical or radiological diagnosis of pneumonia acquired in the community
- Admission during the study time

Criteria for exclusion

- Pneumonia contracted at a hospital
- Congenital lung deformities
- Long-term lung disease (not asthma)
- Known lack of immunity
- Medical records that are not complete

Definition of the case: Community-acquired pneumonia was characterized as an acute lower respiratory tract infection presenting with cough or dyspnea, accompanied by age-appropriate tachypnea and/or retraction of the chest, with or without radiographic confirmation of pneumonia.[4]

Data collection

We used a systematic proforma to get data from medical records. It included: • Information on the people • Showing symptoms

- Signs in the clinic
- Oxygen saturation when they got there
- Lab tests (CRP and procalcitonin if they are available)
- Results from a chest X-ray
- Treatment given
- Results in the clinic

Statistical Analysis: We used conventional statistical software (SPSS version XX / R version X.X) to do the statistical analysis. We showed categorical variables as frequencies and percentages, and we showed continuous variables as either the mean ± standard deviation or the median with the interquartile range (IQR), depending on how the data was spread out.

We used the Chi-square test or Fisher's exact test to look at relationships between categorical variables where the predicted cell counts were less than five. The independent samples t-test or Mann–Whitney U test was used to compare continuous variables when it was appropriate.

A p-value of less than 0.05 was deemed statistically significant.

RESULTS

Demographic Characteristics: Among the 100 children included, 58% were males and 42% females, giving a male-to-female ratio of 1.38:1. The median age was 26 months (IQR: 9–54 months). A majority of children (62%) were under 5 years of age, reflecting the higher vulnerability of younger children to lower respiratory tract infections.

No statistically significant association was found between age group (<5 years vs ≥5 years) and occurrence of hypoxia ($p = 0.41$).

Clinical Symptomatology: The distribution of presenting symptoms and signs is shown in [Table 1].

- Fever was present in 93% of cases, with high-grade fever (>39°C) documented in 48%.
- Cough was reported in 92% of children.
- Tachypnea, defined using age-adjusted WHO cut-offs, was observed in 76%.
- Chest indrawing was present in only 24%, whereas wheeze was documented in 27% of patients.

The prevalence of wheeze was significantly higher among children aged ≥5 years compared to those <5 years (41% vs 19%, $\chi^2 = 4.21$, $p = 0.04$), suggesting a possible association with atypical or viral etiology.

Table 1: Clinical features and severity markers in pediatric CAP (N = 100)

Variable	Present n (%)	Absent n (%)	p-value*
Fever	93 (93)	7 (7)	—
High fever (>39°C)	48 (48)	52 (52)	—
Tachypnea	76 (76)	24 (24)	—
Chest indrawing	24 (24)	76 (76)	—
Wheeze	27 (27)	73 (73)	—
Rhinorrhoea	61 (61)	39 (39)	—
Hypoxia (SpO_2 <92%)	29 (29)	71 (71)	—

*p-values are shown in subgroup analyses below.

Hypoxia and Severity Analysis

Hypoxia (SpO_2 <92%) was observed in 29% of children on admission.

Hypoxia was significantly associated with chest indrawing.

- Chest indrawing present: 15/24 (62.5%)
- Chest indrawing absent: 14/76 (18.4%)
- $\chi^2 = 18.9$, $p < 0.001$

Hypoxia was not significantly associated with presence of wheeze

- Wheeze present: 9/27 (33.3%)
- Wheeze absent: 20/73 (27.4%)
- $p = 0.56$

Children with hypoxia had a significantly longer hospital stay (median 7 days vs 4 days, $p = 0.01$).

Complications and Intensive Care Requirement

Complicated pneumonia was documented in 12% of cases.

Complications were significantly more common among children with:

- High fever (>39°C): 10/48 vs 2/52 ($\chi^2 = 6.9$, $p = 0.008$)
- Elevated CRP (>40 mg/L): 9/28 vs 3/72 ($\chi^2 = 11.2$, $p = 0.001$)

A total of 9 children (9%) required ICU admission.

ICU admission was significantly associated with:

- Hypoxia (7/29 vs 2/71; $p = 0.002$)
- Complicated pneumonia (6/12 vs 3/88; $p < 0.001$)

Etiological Pattern (Inferred)

Based on clinical presentation, inflammatory markers, and available microbiology:

- Suspected viral/atypical pneumonia: 52%
- Suspected bacterial pneumonia: 48%

Children with suspected bacterial pneumonia had:

- Higher median CRP (56 mg/L vs 18 mg/L, $p < 0.001$)
- Higher frequency of chest indrawing (35% vs 14%, $p = 0.01$)

These findings are illustrated in [Figure 2].

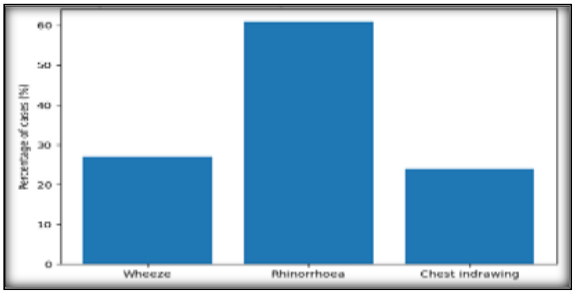

Figure 1: Distribution of major presenting clinical features of community-acquired pneumonia.

Severity and outcomes: Complicated pneumonia was observed in 12 children (12%), including pleural effusion and empyema. Oxygen therapy was required in 29% of cases, and 9 children (9%) required intensive care unit admission.

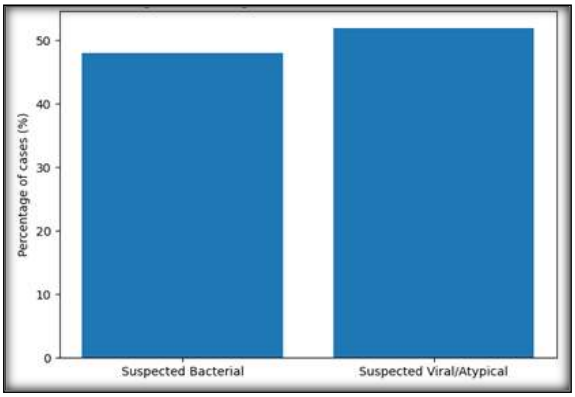

Figure 2: Proportion of suspected bacterial versus viral/atypical pneumonia.

DISCUSSION

This study underscores significant alterations in the clinical symptomatology of pediatric community-acquired pneumonia in a modern context. Although fever and cough persist as the primary presenting symptoms, classical indicators often linked to bacterial pneumonia, such as chest indrawing, were noted with reduced frequency.

The relatively high prevalence of wheezing (27%) and rhinorrhea (61%) indicates a rising influence of viral and atypical pathogens, aligning with recent study findings.[6,9] These presentations may coincide with bronchiolitis and asthma-related lower respiratory tract infections, confounding clinical diagnosis.

Hypoxia was noted in nearly one-third of children, underscoring the significance of routine pulse oximetry in the evaluation of pediatric CAP.[10] Even though the sickness was only moderately severe overall, the fact that 12% of cases had complications shows how important it is to keep a close eye on things and act quickly.

The diminished incidence of chest indrawing vs to historical data may indicate the effects of vaccination initiatives and enhanced access to early healthcare.[5,11] These results advocate for a transition from dependence on isolated clinical indicators to a more holistic evaluation that includes oxygen saturation and laboratory markers.

Limitations

- Study design that looks back
- Experience at one center
- Limited microbiological confirmation of etiology

CONCLUSION

The clinical manifestation of community-acquired pneumonia in children is undergoing transformation. Classical indicators of severe bacterial pneumonia are becoming less prevalent, although wheeze-associated and viral-like manifestations are increasingly noted. These modifications require revisions in clinical assessment methodologies to guarantee effective treatment and antibiotic stewardship.

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