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Original Research Article

Current Clinical Profiles of Acute Respiratory Tract Infections in Children between 2 Months to 5 Years

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Abstract

Background: Acute respiratory tract infections (ARTIs) are among the leading causes of childhood morbidity and mortality worldwide, especially in children aged 2 months to 5 years. Their clinical spectrum varies from mild upper respiratory tract infections to severe lower respiratory involvement.

Aim: To delineate the respiratory disease profiles of children aged 2 months to 5 years presenting with ARTIs.

Material and Methods: A hospital-based observational cross-sectional study was conducted including 120 children aged 2 months to 5 years with clinical features of ARTI. Detailed demographic data, presenting complaints, and clinical diagnoses were recorded. Data were analyzed to determine the distribution of upper and lower respiratory tract infections.

Results: Nasopharyngitis (34.2%) was the most common condition, followed by pneumonia (14.2%) and bronchiolitis (10.8%). Fever, cough, and cold were the predominant presenting complaints. Less frequent conditions included sinusitis, tonsillopharyngitis, croup, and epiglottitis. Male children were slightly more affected (55%) compared to females (45%).

Conclusion: ARTIs in under-five children remain a major public health concern, with nasopharyngitis, pneumonia, and bronchiolitis as the most frequent diagnoses. Early recognition, vaccination, and access to diagnostic tools are crucial to improving outcomes and reducing the disease burden.

Keywords: Acute respiratory tract infections, Children under five, Pneumonia, Bronchiolitis.

Introduction

Acute respiratory tract infections (ARTIs) remain among the most pervasive and burdensome illnesses in early childhood, particularly affecting children aged 2 months to 5 years, during a critical phase of immune and respiratory tract development [1]. Globally, ARTIs account for substantial morbidity and mortality within this age group, often leading to repeated outpatient visits, hospital admissions, and in severe cases, death—highlighting the pressing need to understand their clinical profiles [2].

In developing countries such as India, ARTIs contribute to nearly one-third of pediatric outpatient consultations and an even larger proportion of pediatric hospital admissions, placing considerable strain on already constrained healthcare systems [3]. A recent regional cross-sectional analysis from Western Maharashtra reports that upper respiratory tract infections (URTIs)—notably nasopharyngitis and tonsillopharyngitis—predominated (60%), while lower respiratory tract infections (LRTIs) such as pneumonia and bronchiolitis affected close to 45% of children aged 2 months to 5 years [4]. In a similar hospital-based case series from Bihar, 200 children aged 2 months to 5 years with acute lower respiratory tract infections revealed not only clinical presentations but also outcomes closely tied to early diagnosis and management [5].

Emerging surveillance-based insights underscore that viral pathogens are primary drivers of ARTIs in children under five. In Cabo Verde, comprehensive molecular diagnostics identified respiratory viruses as the main causative agents, with clinical presentation and risk factors closely linked to socio-demographic and environmental variables [6]. Broader epidemiological modeling indicates that the leading pathogens include adenoviruses, influenza, human rhinovirus, and Mycoplasma pneumoniae, each exerting a significant burden on pediatric health services worldwide [7]. A recent virology study reported that respiratory syncytial virus (RSV) alone accounted for approximately 43% of viral

respiratory tract infections in under-five children, underscoring its overwhelming impact [8]. More detailed surveillance systems, such as that in Egypt, confirm the crucial importance of tracking influenza and RSV trends to inform timely clinical and public health responses [9]. In addition, evolving global surveillance highlights that viruses such as human metapneumovirus (hMPV)—the second most common cause of ARTI in outpatient children under five—are gaining recognition as significant contributors to the pediatric ARTI burden [10].

Against this backdrop, the current study aimed to comprehensively delineate the clinical profiles of acute respiratory tract infections in children aged 2 months to 5 years, thereby informing clinicians and public health practitioners on predominant disease patterns and facilitating optimized management strategies.

Material and Methods

The present study was designed as a hospital-based observational cross-sectional study conducted in the Department of Pediatrics of a tertiary care teaching hospital over a period of twelve months. A total of 120 children between the ages of 2 months and 5 years who presented with symptoms suggestive of acute respiratory tract infection were enrolled. Ethical approval was obtained from the Institutional Ethics Committee prior to initiation of the study, and written informed consent was taken from parents or legal guardians of all participants.

Children aged 2 months to 5 years with clinical features of acute respiratory tract infection, including cough, fever, nasal discharge, tachypnea, respiratory distress, or auscultatory abnormalities, were included in the study. Exclusion criteria comprised children with known congenital heart disease, immunodeficiency disorders, chronic lung disease, severe malnutrition, or those who had received antibiotics or antiviral drugs within 48 hours prior to presentation. Detailed demographic and clinical data were collected using a predesigned proforma, which included age, sex, nutritional status, socioeconomic background, history of present illness, and past medical history. Clinical examination was performed with emphasis on respiratory rate, presence of chest indrawing, use of accessory muscles, auscultatory findings, oxygen saturation, and presence of systemic involvement. Anthropometric measurements were recorded to assess nutritional status. Investigations were performed as indicated and included complete blood count, C-reactive protein, chest radiography, and pulse oximetry. Viral diagnostic assays such as rapid antigen detection for respiratory syncytial virus and influenza were carried out wherever feasible. Children were categorized clinically into upper respiratory tract infections, including nasopharyngitis, pharyngitis, tonsillitis, and otitis media, and lower respiratory tract infections, including pneumonia, bronchiolitis, and bronchitis, based on clinical and radiological findings.

The sample size of 120 was selected to ensure adequate representation of both upper and lower respiratory tract infection profiles in the study population. Data were compiled and coded systematically. Statistical analysis was performed using SPSS software version XX. Continuous variables were expressed as mean ± standard deviation and compared using Student's t-test or Mann–Whitney U test as appropriate. Categorical variables were expressed as proportions and compared using Chi-square test or Fisher's exact test. A p-value of less than 0.05 was considered statistically significant.

Results

In this study, the demographic distribution of children aged 2 months to 5 years with acute respiratory tract infections is summarized in Table 1. The majority of the cases were seen in the age group of 0–1 year (41.7%), followed by 1–2 years (20.0%). The proportion of children gradually decreased with increasing age, with the least cases being observed in the 4–5 year age group (5.8%). The mean age distribution shows that younger children are disproportionately more affected. Male children constituted a slightly higher proportion of cases (55.0%) compared to females (45.0%), indicating a mild male preponderance.

Regarding presenting complaints, fever was the most frequent symptom, with 55.8% of children presenting with it, while 17.5% had fever as the predominant complaint. About 15.8% of children reported only mild fever and 10.8% had no fever. Cough was present in 74.2% of children, and in 10.0% it was the predominant feature, while only 15.8% had no cough. Cold was reported in 80.8% of cases, while breathlessness was noted in 7.5% of children. Chest pain was uncommon, seen in less than 1% of the cases. Sore throat was present in 12.0% of children, and sinus tenderness was noted in just 3.3%. The final clinical diagnosis revealed that nasopharyngitis (34.2%) was the most common condition, followed by pneumonia (14.2%) and bronchiolitis (10.8%), as shown in Table 1. Other conditions included wheeze-associated lower respiratory infection (9.6%), tonsillopharyngitis (6.7%), and nasopharyngitis with pneumonia (9.2%). Less frequent diagnoses were sinusitis, tonsillitis, pleuritis, croup, and epiglottitis, which together constituted less than 10% of the total cases. These findings reflect that acute respiratory tract infections in this age group predominantly manifest as nasopharyngeal infections, with a significant proportion also presenting as lower respiratory tract involvement.

Table 1: Summary of different variables (N=120)

Variables	Sub-category	Number of patients N (%)
Age (years)	0–1	50 (41.7)
	1–2	24 (20.0)
	2–3	15 (12.5)
	3–4	10 (8.3)
	4–5	7 (5.8)
Gender	Female	54 (45.0)
	Male	66 (55.0)
Complaints	Fever absent	13 (10.8)
	Fever mild	19 (15.8)
	Fever predominant	21 (17.5)
	Fever present	67 (55.8)
	Cough absent	19 (15.8)
	Cough predominant	12 (10.0)
	Cough present	89 (74.2)
	Cold absent	23 (19.2)
	Cold present	97 (80.8)
	Breathlessness absent	111 (92.5)
	Breathlessness present	9 (7.5)
	Chest pain absent	119 (99.2)
	Chest pain present	1 (0.8)
	Sore throat absent	105 (87.5)
	Sore throat present	15 (12.5)
	Sinus tenderness absent	116 (96.7)
	Sinus tenderness present	4 (3.3)
Condition	Bronchiolitis	13 (10.8)
	Croup	4 (3.3)
	Epiglottitis	1 (0.8)
	Nasopharyngitis	41 (34.2)
	Nasopharyngitis + pneumonia	11 (9.2)
	Nasopharyngitis + sinusitis	1 (0.8)
	Pleuritis	1 (0.8)
	Pneumonia	17 (14.2)
	Pneumonia + sinusitis	3 (2.5)
	Sinusitis	4 (3.3)
	Tonsillitis	2 (1.7)
	Tonsillopharyngitis	8 (6.7)
	Tonsillopharyngitis + pneumonia	2 (1.7)
	Wheeze-associated lower respiratory infection (WALRI)	12 (10.0)

Discussion

The present study highlights that acute respiratory tract infections (ARTIs) continue to constitute a significant health problem among children aged 2 months to 5 years, with nasopharyngitis, pneumonia, and bronchiolitis emerging as the leading conditions. The predominance of upper respiratory tract infections, particularly nasopharyngitis, is consistent with recent global and regional findings which suggest that viral etiologies are the principal contributors to pediatric respiratory illness. A multicentric Asian surveillance project identified rhinovirus, RSV, and influenza as the most frequent pathogens in this age group, with clinical presentations overlapping considerably between URTIs and LRTIs [11]. The high proportion of pneumonia observed in this study underscores the persisting burden of lower respiratory tract infections in under-five children. Recent estimates from sub-Saharan Africa and South Asia reaffirm pneumonia as the leading cause of infectious mortality in this age group, despite the introduction of pneumococcal and Hib vaccines [12]. In our cohort, pneumonia often presented concurrently with nasopharyngitis, reflecting the continuum from mild upper tract illness to severe lower tract involvement.

Bronchiolitis and wheeze-associated lower respiratory infections accounted for nearly one-fifth of the clinical diagnoses. RSV remains the dominant viral pathogen associated with bronchiolitis globally, and epidemiological models suggest seasonal peaks contribute substantially to pediatric hospital admissions [13]. This reinforces

the importance of early recognition and supportive management in infants, who remain most vulnerable to severe disease.

Interestingly, conditions such as croup, epiglottitis, and sinusitis were relatively uncommon in our study, reflecting the impact of improved vaccination coverage and early interventions. However, emerging evidence suggests that viral croup associated with parainfluenza and influenza viruses remains sporadically significant, particularly in the post-pandemic period where viral circulation patterns have shifted [14].

The clinical spectrum observed in our study also aligns with global surveillance data that emphasize the importance of viral diagnostics in differentiating between overlapping syndromes of ARTI. Rapid point-of-care testing, though not universally available in low- and middle-income countries, has been shown to reduce unnecessary antibiotic prescribing and improve case management in pediatric populations [15]. Hence, integrating diagnostic innovations with robust clinical evaluation remains a cornerstone in tackling ARTI in young children.

Conclusion

The findings of this study demonstrate that ARTIs in children aged 2 months to 5 years are predominantly due to nasopharyngitis, pneumonia, and bronchiolitis, with fever, cough, and cold being the most common presenting complaints. While upper respiratory tract infections predominate, the substantial proportion of pneumonia and bronchiolitis highlights the continued relevance of lower respiratory involvement in this age group.

Strengthening preventive strategies, ensuring timely vaccination, and expanding access to diagnostic tools are essential to reduce morbidity.

Early recognition and tailored management can significantly alter outcomes and help alleviate the burden of ARTI in under-five children.

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