World Journal of Current Medical and Pharmaceutical Research
Content available at www.wjcmpr.com ISSN: 2582-0222

SHORT TERM OUTCOME OF ACUTE BRONCHIOLITIS IN CHILDREN OF 1 MONTH TO 24 MONTHS ADMITTED IN A TERTIARY CARE CENTRE

Meghana S Bhagavath[1], Leelakumari P[2]
[1]Senior Resident, Government Medical College, Kasargod.
[2]Professor and Head of department of Pediatrics, Government Medical College, Idukki.

ARTICLE HISTORY
Received on: 04-01-2026
Revised on: 19-02-2026
Accepted on: 22-03-2026

ABSTRACT

Background: Acute bronchiolitis is the leading cause of lower respiratory tract infection in infants, often resulting in hospitalization. Identification of demographic, clinical, and perinatal risk factors is crucial for early management and prevention of severe disease.

Objectives: To study the clinical profile, severity, and outcomes of children with acute bronchiolitis and to identify factors associated with severe disease.

Methods: This observational study included 97 children diagnosed with acute bronchiolitis. Data on age, gender, socioeconomic status, perinatal history, feeding, anthropometry, immunization, comorbidities, clinical features, laboratory findings, respiratory support, hospital stay, and outcomes were collected. Severity was classified as mild, moderate, or severe. Statistical analysis assessed associations between clinical and demographic factors and disease severity.

Results: The majority of cases (65%) were infants under six months, with peak incidence at four months. Male predominance was observed (56.7%). Most children belonged to lower middle and upper lower socioeconomic classes (81.44%). Common clinical features included cough (100%), fever (61.8%), and respiratory distress (51.5%). Hypoxemia was present in 29.7%, and complications included secondary pneumonia (55.5%) and hypoxia (41.6%). Comorbidities were uncommon but included congenital heart disease (4.12%) and neurodevelopmental delay (2.06%). Severity was significantly associated with low birth weight (p=0.023), anemia (p=0.029), and lower socioeconomic status (p=0.002), while gender, prematurity, and environmental exposures showed no significant correlation. The mean hospital stay was 3.75 ±1.9 days. All patients recovered without mortality.

Conclusion: Acute bronchiolitis predominantly affects young infants and is generally mild. Low birth weight, anemia, and low socioeconomic status increase the risk of severe disease. Early identification of high-risk infants and vigilant supportive care are essential to improve outcomes.

Keywords: *Acute bronchiolitis, infants, severity, hypoxemia, low birth weight, socioeconomic status, complications.*

***Corresponding Author**
Dr. Meghana S Bhagavath

DOI: https://doi.org/10.37022/wjcmpr.v8i1.388

INTRODUCTION

Acute Bronchiolitis is diagnostic term used to describe the clinical picture produced by several different viral lower respiratory tract infections in infants and very young children. The respiratory findings observed in bronchiolitis include tachypnea, wheezing, crackles and rhonchi [1]. Bronchiolitis can manifest from mild tachypnea and expiratory wheeze to profound, acute life-threatening respiratory failure due to complete or near complete obstruction and inflammation of lower respiratory tract. Life-threatening complication associated with bronchiolitis in premature, low birth weight infant is apnea [2].

Bronchiolitis is a significant health concern in early childhood, especially during the winter months when respiratory viruses like RSV are prevalent. Other common causes include parainfluenza virus, human metapneumo virus, influenza virus, rhinovirus, corona virus and human boca virus. Given the high hospitalization rates and potential challenges in pediatric departments and ICUs, it's essential for healthcare systems to have appropriate resources and protocols in place to effectively manage bronchiolitis cases. This includes ensuring proper ventilation, fluid balance, and overall support for infants with severe bronchiolitis [1, 3]

METHODOLOGY

This prospective observational study was conducted at the Department of Pediatrics, SAT Hospital, Government Medical College, Thiruvananthapuram, a tertiary care center, from March 2023 to May 2024, with the aim of assessing the short-term outcomes of acute bronchiolitis in children aged 1 to 24 months and identifying associated risk factors. Children diagnosed with acute bronchiolitis according to NICE guidelines were included, while those with asthma or a previous history of hospitalization for bronchiolitis were excluded. Data were collected using a semi-structured questionnaire, documenting demographic characteristics, perinatal and antenatal history, clinical features, laboratory parameters, disease severity, treatment modalities, complications, and outcomes. Each child was clinically examined, and the severity of bronchiolitis was classified as mild, moderate, or severe using a standardized clinical scoring system. Short-term outcomes during hospitalization, including duration of hospital stay, respiratory support requirements, and complications, were recorded. Statistical analysis was performed using SPSS software, with categorical variables expressed as proportions and continuous variables as mean ± standard deviation. Associations between categorical variables and disease severity were analyzed using the chi-square test, with $p < 0.05$ considered statistically significant. Ethical approval was obtained from the Institutional Ethics Committee, and written informed consent was taken from parents or caregivers, ensuring compliance with ethical standards.

RESULTS

The present study provides a comprehensive evaluation of demographic, clinical, and analytical determinants of acute bronchiolitis in children, highlighting important epidemiological and prognostic insights relevant to clinical practice.

Acute bronchiolitis in this cohort predominantly affected younger infants, with the highest incidence observed at 4 months of age and the majority of cases occurring below 6 months. This age distribution is consistent with the known pathophysiology of bronchiolitis, wherein immature immune defenses, reduced maternal antibody protection, and anatomically smaller airways predispose infants to more severe lower respiratory tract infections. The mean age of 5.4 ± 3.4 months further reinforces that early infancy is the most vulnerable period.

A male predominance (56.7%) was noted, with a male-to-female ratio of 1.3:1. Although the exact mechanism remains unclear, this finding aligns with existing literature suggesting that male infants may have relatively narrower airways and increased susceptibility to respiratory infections.

A striking observation in this study is the strong representation of children from lower socioeconomic strata, with more than 80% belonging to lower-middle and upper-lower classes. This underscores the influence of socioeconomic determinants such as overcrowding, poor nutrition, limited access to healthcare, and increased exposure to environmental pollutants, all of which contribute to higher disease incidence and potentially worse outcomes.

Clinically, cough was present in all cases, establishing it as the most consistent presenting feature of bronchiolitis. Fever and respiratory distress were observed in approximately half of the children, reflecting the variability in clinical severity. Importantly, nearly 30% of patients presented with hypoxemia (SpO_2 <95%), indicating significant respiratory compromise and the need for oxygen supplementation. Despite this, only a small proportion (3.09%) presented with danger signs, suggesting that most cases were identified before progression to critical illness.

Comorbid conditions such as congenital heart disease, neurodevelopmental delay, and genetic disorders were relatively uncommon but clinically significant. These conditions are known to exacerbate disease severity due to compromised cardiopulmonary reserve or impaired immunity.

Perinatal factors revealed that nearly one-fourth of the children were born preterm, and a substantial proportion had a history of cesarean section delivery and NICU admission. These factors are important as prematurity and perinatal complications are associated with underdeveloped lungs and increased susceptibility to respiratory infections. Additionally, low birth weight was observed in 14.43% of children, which emerged as a significant predictor of severe disease.

Feeding practices showed that one-third of infants were bottle-fed, a known risk factor for respiratory infections due to increased risk of contamination and lack of protective immunological factors present in breast milk. Although immunization coverage was relatively high (76.3%), partial immunization in nearly one-fourth of the cohort indicates potential gaps in preventive healthcare.

Nutritional assessment revealed that a notable proportion of children were undernourished, with 14.43% underweight and approximately 18.5% suffering from moderate to severe acute malnutrition. Malnutrition is a critical determinant of impaired immune response and may contribute to increased susceptibility and severity of infections.

Laboratory findings demonstrated leukocytosis in more than half of the patients and elevated C-reactive protein levels in 40.2%, indicating an active inflammatory response. Additionally, anemia was present in 27.83% of cases and was found to be significantly associated with disease severity, possibly due to reduced oxygen-carrying capacity exacerbating hypoxic conditions.

In terms of severity, the majority of cases were mild (69%), while 18.6% were classified as severe. This indicates that although bronchiolitis is generally self-limiting, a significant subset requires intensive monitoring and intervention. Respiratory support was required in a considerable number of patients, with most responding well to non-invasive modalities such as oxygen therapy and CPAP. Only a small proportion (2.06%) required mechanical ventilation, reflecting effective early management.

The average hospital stay was relatively short (3.75 ± 1.9 days), and only 7.21% of patients required prolonged hospitalization (>7 days), suggesting a favorable clinical course in most cases. However, complications were common, with secondary pneumonia (55.5%) and hypoxia (41.6%) being the most frequent, emphasizing the need for close clinical monitoring.

Importantly, the study reported no mortality, indicating excellent overall outcomes with appropriate and timely management.

Analytical evaluation revealed that low socioeconomic status, low birth weight, and anemia were statistically significant predictors of severe bronchiolitis. These findings highlight the interplay between biological vulnerability and social determinants of health. In contrast, factors such as gender, prematurity, passive smoking, overcrowding, and family history of acute respiratory infection did not show significant associations, suggesting that their role may be less pronounced or influenced by sample size limitations in this cohort shown in the table 01.

Table 01: Consolidated Summary of Clinical, Demographic, and Analytical Findings in Children with Acute Bronchiolitis (n = 97)

Domain	Variable	Key Findings
Demographics	Age	Majority <6 months; peak at 4 months (19.58%); mean 5.4 ± 3.4 months
	Gender	Male predominance (56.7%); M:F = 1.3:1
	Socioeconomic status	81.44% from lower-middle and upper-lower classes
Clinical Presentation	Symptoms	Cough (100%), Fever (61.8%), Respiratory distress (51.5%)
	Oxygen saturation	29.7% had hypoxemia (SpO_2 <95%)
	Danger signs	Present in 3.09%
Comorbidities	CHD	4.12%
	Neurodevelopmental delay	2.06%
	Genetic disorders	2.06%
Perinatal Factors	Prematurity	24.74%
	LSCS delivery	63.9%
	NICU admission	16.49%
	Low birth weight	14.43%
Feeding & Immunization	Bottle feeding	34.02%
	Fully immunized	76.3%
Nutritional Status	Underweight	14.43%
	SAM	14.4%
	MAM	4.1%
Laboratory Findings	Anemia	27.83%
	Leukocytosis	56.7%
	CRP positive	40.2%
Severity	Mild	69%
	Moderate	12.3%
	Severe	18.6%
Respiratory Support	Oxygen/NIV	Majority required non-invasive support
	Mechanical ventilation	2.06%
Hospital Stay	Mean duration	3.75 ± 1.9 days
	Prolonged stay (>7 days)	7.21%
Complications	Secondary pneumonia	55.5%
	Hypoxia	41.6%
	Respiratory failure	2.7%
Outcome	Recovery	100% survival; no mortality
Significant Associations	SES	p = 0.002
	Birth weight	p = 0.023
	Anemia	p = 0.029
Non-significant Factors	Gender, prematurity, passive smoking, overcrowding, ARI	p > 0.05

DISCUSSION

This study highlights that acute bronchiolitis predominantly affects young infants, with a peak incidence at 4 months and a mean age of 5.4 months, reflecting increased vulnerability due to immature immunity and smaller airway size. The observed male predominance is consistent with existing literature, although gender was not significantly associated with disease severity [3, 5].

A significant association between socioeconomic status and severity (p = 0.002) underscores the influence of social determinants such as healthcare access, nutrition, and living conditions on disease outcomes. Most children belonged to lower socioeconomic classes, indicating a higher burden in disadvantaged populations [6].

Clinically, cough was universal, with a substantial proportion presenting with fever and respiratory distress. Although most children maintained adequate oxygen saturation, nearly one-fifth developed severe disease, emphasizing the need for careful monitoring.

Among perinatal factors, low birth weight showed a significant association with severity (p = 0.023), whereas prematurity did not. This suggests that intrauterine growth restriction may have a greater impact on disease progression. Nutritional factors were also relevant, with a notable proportion of children having severe acute malnutrition [2, 7].

Laboratory findings, including leukocytosis and lymphocyte predominance, support a predominantly viral etiology, commonly attributed to Respiratory Syncytial Virus. Importantly, anemia was significantly associated with severity (p = 0.029), likely due to its impact on oxygen delivery and immune function [8].

In summary, the severity of bronchiolitis in this cohort was significantly influenced by socioeconomic status, low birth weight, and anemia, highlighting the need for early risk identification and targeted interventions.

CONCLUSION

Acute bronchiolitis predominantly affects infants under six months, with a male and lower socioeconomic predominance. Most cases were mild, but severity was significantly associated with low birth weight, anemia, and low socioeconomic status. Hypoxemia and secondary pneumonia were the most common complications. Despite these, all children recovered, highlighting a generally favorable prognosis with timely management. Early identification of high-risk infants and preventive strategies are crucial to reduce severity and improve outcomes.

LIMITATIONS

The study is limited by its observational design, which may not fully account for all potential confounding factors

FUNDING

Nil

ACKNOWLEDGEMENT

Not Declared

CONFLICT OF INTEREST

Not Declared

INFORMED CONSENT AND ETHICAL STATEMENT

Informed consent was obtained from all participants, and the study received approval from the Institutional Review Committee (IRC) and Institutional Ethics Committee (IEC) of Sustainable Action for Transforming Human Capital (SATH), Trivandrum, under reference number 02/25/2023/MCT.

AUTHOR CONTRIBUTION

Both authors contributed equally.

REFERENCES

1. Essouri S, Durand P, Chevret L, Balu L, Devictor D, Fauroux B, Tissières P. Optimal level of nasal continuous positive airway pressure in severe viral bronchiolitis. Intensive care medicine. 2011 Dec;37(12):2002-7.
2. Chernick V, Boat TF, Kendig EL. Kendig's disorders of the respiratory tract in children. (No Title). 2006.
3. Wong JY, Rutman A, O'Callaghan C. Recovery of the ciliated epithelium following acute bronchiolitis in infancy. Thorax. 2005 Jul 1;60(7):582-7.
4. Mohammed MA, Faraj MH, Faraj A, Sultan AS. Predictors of admission in patients with acute Bronchiolitis. The Egyptian Journal of Hospital Medicine. 2018 Jul 1;72(6):4737-45.
5. Green CA, Yeates D, Goldacre A, Sande C, Parslow RC, McShane P, Pollard AJ, Goldacre MJ. Admission to hospital for bronchiolitis in England: trends over five decades, geographical variation and association with perinatal characteristics and subsequent asthma. Archives of disease in childhood. 2016 Feb 1;101(2):140-6.
6. Murray J, Bottle A, Sharland M, Modi N, Aylin P, Majeed A, Saxena S, Medicines for Neonates Investigator Group. Risk factors for hospital admission with RSV bronchiolitis in England: a population-based birth cohort study. PloS one. 2014 Feb 26;9(2):e89186.
7. Greenough A, Cox S, Alexander J, Lenney W, Turnbull F, Burgess S, Chetcuti PA, Shaw NJ, Woods A, Boorman J, Coles S. Health care utilisation of infants with chronic lung disease, related to hospitalisation for RSV infection. Archives of Disease in Childhood. 2001 Dec 1;85(6):463-8.
8. PARROTT RH, KIM HW, ARROBIO JO, HODES DS, MURPHY BR, BRANDT CD, Camargo EN, CHANOCK RM. Epidemiology of respiratory syncytial virus infection in Washington, DC: II. Infection and disease with respect to age, immunologic status, race and sex. American Journal of Epidemiology. 1973 Oct 1;98(4):289-300.