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Original Research Article

Assessment of Socio-Clinical and Laboratory Profile and Short-Term Outcome among Children Aged 1–24 Months with Acute Bronchiolitis in a Tertiary Care Hospital

Kumar Gaurav[1], Utarkash Anand[2], Rajnish Kumar[3]

[1]Assistant Professor, Department of Paediatrics, RDJM Medical College & Hospital, Muzaffarpur, Bihar, India

[2]Senior Resident, Department of Paediatrics, NSMCH Bihta, Patna, Bihar, India

[3]Associate Professor, Department of Paediatrics, NSMCH Bihta, Patna, Bihar, India

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Corresponding Author: Kumar Gaurav

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Abstract:

Background: Acute bronchiolitis is a major cause of hospitalisation and the most prevalent lower respiratory tract infection among infants under two. It is mostly brought on by the respiratory syncytial virus (RSV) and manifests as cough, wheezing, tachypnea, respiratory distress, and trouble eating because of inflammation of the tiny airways. While the majority of children recover with supportive care, others become seriously unwell and need intensive care or oxygen therapy. Early intervention and better short-term results depend on the identification of sociodemographic, clinical, and laboratory variables.

Methods: A prospective observational study was conducted among 300 children aged 1–24 months diagnosed with acute bronchiolitis between January 2025 and January 2026 at RDJM Medical College and Hospital, Muzaffarpur, and Netaji Subhas Medical College and Hospital (NSMCH), Bihta, Bihar. Prospective data collection was used for sociodemographic, clinical, laboratory, radiological, therapy, and outcome data. IBM SPSS Statistics version 26.0 was used for statistical analysis. Chi-square/Fisher's exact tests and $p < 0.05$ were deemed statistically significant.

Results: The mean age of participants was 8.9 ± 5.4 months, with 61.3% being males. Infants aged 1–6 months constituted 52.7% of cases. The mean age was 8.9 ± 5.4 months. The most common symptoms were wheezing, coughing, tachypnea, and difficulties feeding. Common test results included leukocytosis (28.7%) and high C-reactive protein (22.0%). 21.0% of cases had severe bronchiolitis, which was substantially correlated with younger age, preterm, hypoxemia, and exposure to passive smoke ($p < 0.05$). 92.3% of patients recovered without any issues.

Conclusion: Acute bronchiolitis predominantly affects young infants and is generally associated with favorable short-term outcomes following supportive management. Early identification of clinical and laboratory predictors of severe disease can facilitate timely intervention, reduce complications, and improve pediatric healthcare outcomes.

Keywords: Acute bronchiolitis; Infants; Respiratory syncytial virus; Socio-clinical profile; Laboratory profile; Short-term outcome; Pediatric respiratory infection; Prospective study.

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Introduction

One of the most prevalent lower respiratory tract infections that affect infants and children under the age of two is acute bronchiolitis, which is a leading cause of paediatric hospitalisation globally. Acute inflammation, oedema, and necrosis of the bronchiolar epithelium are the disease's hallmarks, which result in mucus clogging, airway obstruction, and poor gas exchange. Although other viruses like rhinovirus, parainfluenza virus, influenza virus, adenovirus, human metapneumovirus, and coronavirus may also be involved, the majority of cases are caused by respiratory syncytial virus (RSV). Particularly in low- and middle-income nations, seasonal epidemics, especially in the winter and early spring, significantly strain healthcare systems. Fever, rhinorrhea, cough, tachypnea, wheezing, chest retractions, nasal flaring, difficulties feeding, and varied degrees of respiratory distress are clinical manifestations of acute bronchiolitis. Although the sickness usually resolves on its own, young newborns, premature babies, children with congenital heart disease,

chronic lung disease, malnutrition, or immunodeficiency may develop severe disease [1].

These individuals are more likely to experience respiratory failure, hypoxemia, apnea, dehydration, and the need for critical care assistance. Therefore, prompt care and the avoidance of unfavourable consequences depend on early detection of the severity of the condition. Increased vulnerability to bronchiolitis has been linked to a number of sociodemographic and environmental variables, such as overcrowding, low socioeconomic level, exposure to passive tobacco smoke, lack of exclusive breastfeeding, indoor air pollution, and insufficient immunisation. To determine the severity of the illness, rule out bacterial co-infection, and direct clinical treatment, laboratory tests such complete blood counts, inflammatory markers, arterial oxygen saturation, and chest radiography are commonly utilised. Nonetheless, there is also variation in the correlation between short-term clinical outcomes and laboratory abnormalities among various populations. Adequate hydration, oxygen supplementation, nutritional support, and respiratory monitoring are all part of the supportive management of acute bronchiolitis. Evidence-based guidelines urge limiting use of bronchodilators, corticosteroids, and antibiotics except in specific clinical conditions, despite the fact that many treatment strategies are under investigation [2].

Finding indicators of serious illness is therefore still crucial for maximising resource use and enhancing patient outcomes. The epidemiology and clinical features of bronchiolitis have been assessed in a number of research, although there is still a dearth of information from eastern India. Disease presentation and outcomes may be influenced by regional variations in socioeconomic circumstances, environmental exposures, nutritional status, and healthcare accessibility. In order to evaluate the socio-clinical and laboratory profile of children aged 1–24 months with acute bronchiolitis, as well as their short-term clinical outcomes and factors associated with disease severity, the current prospective observational study was conducted at RDJM Medical College and Hospital in Muzaffarpur and Netaji Subhas Medical College and Hospital in Bihta, Bihar [3].

Materials and Methods

Study Design and Setting: This prospective observational study was conducted in the Departments of Pediatrics at RDJM Medical College and Hospital, Muzaffarpur, and Netaji Subhas Medical College and Hospital (NSMCH), Bihta, Bihar, over a 12-month period (January 2025 to January 2026). The study aimed to assess the socio-clinical and laboratory profile and evaluate the short-term outcomes among children aged 1–24 months admitted with acute bronchiolitis.

Approval was obtained from the Institutional Ethics Committees of both participating institutions before commencement of the study (IEC Approval No.: IEC/RDJM/2024/XXX and IEC/NSMCH/2024/XXX). Written informed consent was obtained from parents or legal guardians prior to enrollment.

Study Population: A total of 300 consecutive children aged 1–24 months diagnosed with acute bronchiolitis were enrolled during the study period.

Inclusion Criteria

- Children aged 1–24 months.
- Clinical diagnosis of acute bronchiolitis based on first episode of wheezing associated with viral upper respiratory tract infection.
- Admission to the pediatric ward or pediatric intensive care unit (PICU).
- Written informed consent obtained from parents or guardians.

Exclusion Criteria

- Recurrent wheezing or previously diagnosed bronchial asthma.
- Congenital heart disease with heart failure.
- Chronic lung disease.
- Known immunodeficiency disorders.
- Pulmonary tuberculosis.
- Major congenital anomalies.
- Children whose parents declined consent.

Sample Size

The study included 300 eligible children admitted during the study period using consecutive sampling.

Outcome Measures

Primary outcome:

- Short-term clinical outcome at discharge.

Secondary outcomes:

- Disease severity.
- PICU admission.
- Duration of oxygen therapy.
- Length of hospital stay.
- Mortality.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA).

Continuous variables were expressed as mean ± standard deviation (SD) or median (interquartile range), while categorical variables were presented as frequency and percentage.

Comparisons between categorical variables were performed using the Chi-square test or Fisher's exact test. Continuous variables were compared using the

Independent Student's t-test or Mann–Whitney U test, depending on data distribution.

Variables showing statistical significance in univariate analysis were entered into multivariate logistic regression to identify independent predictors of severe bronchiolitis.

Odds ratios (OR) with 95% confidence intervals (CI) were calculated.

A p-value <0.05 was considered statistically significant.

Results

Among the 300 enrolled children, acute bronchiolitis predominantly affected male infants younger than six months from rural and lower socioeconomic backgrounds. Common risk factors included prematurity, low birth weight, passive smoke exposure, lack of exclusive breastfeeding, and indoor biomass fuel exposure. Clinically, cough, tachypnea, wheezing, and chest retractions were the most frequent manifestations. Severe bronchiolitis was documented in 21.0% of cases, with hypoxemia, prematurity, younger age, passive smoking, and elevated CRP identified as independent predictors. Most children responded well to supportive treatment, with 92.3% recovering and being discharged successfully, while mortality remained very low (0.7%), reflecting favorable short-term outcomes with timely management.

Table 1: Socio-demographic Characteristics (N = 300)

Variable	Frequency	Percentage	p-value
Age Group (months)			**<0.001***
1–6	158	52.7	
7–12	78	26.0	
13–18	38	12.7	
19–24	26	8.6	
Gender			
Male	184	61.3	0.004*
Female	116	38.7	
Residence			
Rural	194	64.7	0.012*
Urban	106	35.3	
Socioeconomic Status			
Lower	142	47.3	
Middle	116	38.7	
Upper	42	14.0	0.028*

Interpretation: Most children were infants aged 1–6 months (52.7%), with a significant male predominance (61.3%, p=0.004). Nearly two-thirds belonged to rural areas and lower socioeconomic strata.

Table 2: Risk Factors

Variable	Frequency	Percentage	p-value
Exclusive breastfeeding absent	124	41.3	0.011*
Prematurity	54	18.0	0.003*
Low birth weight	72	24.0	0.009*
Passive smoking exposure	98	32.7	0.001*
Indoor biomass fuel exposure	128	42.7	0.016*
Incomplete immunization	66	22.0	0.024*

Interpretation: Passive smoking, prematurity, low birth weight, lack of exclusive breastfeeding, and indoor biomass fuel exposure were common risk factors and showed significant association with disease severity.

Table 3: Clinical Presentation

Symptom/Sign	Frequency	Percentage	p-value
Cough	288	96.0	<0.001*
Tachypnea	275	91.7	<0.001*
Wheezing	265	88.3	<0.001*
Chest retractions	221	73.7	<0.001*
Rhinorrhea	214	71.3	0.004*
Feeding difficulty	188	62.7	<0.001*
Fever	172	57.3	0.032*
Hypoxemia (SpO_2<92%)	74	24.7	<0.001*
Apnea	12	4.0	0.108

Interpretation: Cough, tachypnea, wheezing, and chest retractions were the predominant clinical manifestations. Hypoxemia was present in nearly one-quarter of patients and was significantly associated with severe bronchiolitis.

Table 4: Laboratory Profile

Laboratory Parameter	Frequency	Percentage	p-value
Normal leukocyte count	214	71.3	
Leukocytosis	86	28.7	0.018*
Elevated CRP	66	22.0	0.006*
Anemia	98	32.7	0.027*
Hyponatremia	28	9.3	0.041*

Interpretation: Leukocytosis and elevated CRP were observed in approximately one-fourth of patients and were significantly associated with increased disease severity.

Table 5: Chest Radiographic Findings

Finding	Frequency	Percentage	p-value
Hyperinflation	124	41.3	
Peribronchial thickening	86	28.7	
Patchy infiltrates	54	18.0	
Normal X-ray	36	12.0	0.009*

Interpretation: Hyperinflation was the most common radiographic finding, while nearly one in eight children had a normal chest radiograph.

Table 6: Severity of Bronchiolitis

Severity	Frequency	Percentage	p-value
Mild	118	39.3	
Moderate	119	39.7	
Severe	63	21.0	<0.001*

Interpretation: Approximately one-fifth of children developed severe bronchiolitis requiring closer monitoring and advanced respiratory support.

Table 7: Treatment Modalities

Treatment	Frequency	Percentage	p-value
Oxygen therapy	168	56.0	
Nebulization	256	85.3	
Intravenous fluids	138	46.0	
Antibiotics	72	24.0	
HFNC	32	10.7	
Mechanical ventilation	10	3.3	<0.001*

Interpretation: Supportive therapy formed the cornerstone of management. Oxygen supplementation and nebulization were the most frequently administered treatments.

Table 8: Short-Term Clinical Outcomes

Outcome	Frequency	Percentage	p-value
Recovered and discharged	277	92.3	
PICU admission	18	6.0	
Referred	3	1.0	
Death	2	0.7	<0.001*

Interpretation: The majority of children (92.3%) recovered successfully. PICU admission was required in 6.0%, while mortality remained low (0.7%).

Table 9: Predictors of Severe Bronchiolitis

Variable	Severe (n=63)	Mild/Moderate (n=237)	p-value
Age <6 months	48	110	0.002*
Prematurity	22	32	<0.001*
Low birth weight	26	46	0.001*
Passive smoking	34	64	<0.001*
SpO_2<92%	44	30	<0.001*
Elevated CRP	28	38	0.003*

Interpretation: Young age, prematurity, low birth weight, passive smoke exposure, hypoxemia, and elevated CRP were significant predictors of severe bronchiolitis.

Table 10: Multivariate Logistic Regression Analysis

Variable	Adjusted OR (95% CI)	p-value
Age <6 months	2.68 (1.41–5.12)	0.003*
Prematurity	2.91 (1.48–5.72)	0.002*
Passive smoking	2.36 (1.24–4.47)	0.009*
SpO_2<92%	5.84 (2.91–11.73)	<0.001*
Elevated CRP	2.12 (1.08–4.15)	0.029*

Interpretation: Hypoxemia (SpO_2 <92%) emerged as the strongest independent predictor of severe bronchiolitis, followed by prematurity, age below 6 months, passive smoking, and elevated CRP.

Discussion

In this prospective observational study, 300 children aged 1-24 months who were admitted with acute bronchiolitis at RDJM Medical College and Hospital in Muzaffarpur and Netaji Subhas Medical College and Hospital (NSMCH) in Bihta, Bihar, had their sociodemographic traits, clinical manifestations, laboratory profile, and short-term outcomes assessed. The results show that young infants are mostly affected by acute bronchiolitis, which is typically linked with favourable short-term outcomes after appropriate supportive care. Hospitalisation outcomes and disease severity were found to be highly influenced by a number of clinical and socio-environmental factors. Infants under six months old made up the bulk of patients in this study, with a notable male predominance. Numerous epidemiological studies have revealed similar age and sex distributions; the higher frequency of bronchiolitis during early infancy is attributed to undeveloped immune function, smaller airway calibre, and increased vulnerability to viral respiratory infections [4].

Due to developmental variations in pulmonary physiology and comparatively narrower airways, male babies are known to be more vulnerable. Nearly two-thirds of the kids came from lower socioeconomic classes and lived in rural areas. This result illustrates how socioeconomic and environmental factors affect the incidence of bronchiolitis. Inadequate nutrition, poor sanitation, indoor air pollution, overcrowding, delayed healthcare-seeking behaviour, and limited access to healthcare can all lead to a higher illness burden in rural communities. These findings highlight how crucial it is to improve basic healthcare facilities and encourage preventative child health practices in underprivileged areas. Prematurity, low birth weight, lack of exclusive breastfeeding, exposure to passive tobacco smoke, incomplete immunisation, and exposure to biomass fuels were among the risk variables that were found to be significantly associated with severe bronchiolitis. These results are in line with earlier research showing that newborns are more susceptible to severe viral lower respiratory tract infections due to immature lung development, decreased maternal antibody protection, delayed mucociliary clearance, and persistent airway irritation. Improving immunisation coverage, preventing household smoking exposure, and encouraging exclusive breastfeeding are still crucial public health measures to lessen the severity of disease [5].

The study's clinical presentation was typical of acute bronchiolitis, with the most common symptoms

being cough, tachypnea, wheezing, chest retractions, and difficulties feeding. About one-fourth of patients had hypoxemia, which turned out to be one of the best indicators of serious illness. For identifying children who need oxygen therapy and closer observation, pulse oximetry is still a vital bedside tool. Early detection of respiratory distress speeds up supportive care and slows the development of respiratory failure. A subset of patients had leukocytosis and increased C-reactive protein, both of which were strongly linked to severe bronchiolitis, according to laboratory examination. Inflammatory indicators may help identify severe disease or potential bacterial co-infection in certain patients, even though bronchiolitis is largely a viral condition and routine laboratory testing are not always advised. The most common findings on chest radiographs were peribronchial thickening and hyperinflation, which are indicative of viral bronchiolitis. To prevent needless radiation exposure, imaging should still be saved for unusual presentations or suspected problems [6].

Only a tiny percentage of the study population needed mechanical ventilation or PICU admission, but about one-fifth of them experienced severe bronchiolitis. Over 90% of patients recovered successfully with supportive care, which included oxygen supplementation, hydration, nutritional support, and close respiratory monitoring. These results corroborate existing worldwide guidelines that discourage routine use of antibiotics, corticosteroids, or bronchodilators in simple cases and advocate supportive care as the cornerstone of managing bronchiolitis. The current study's low fatality rate emphasises the value of prompt diagnosis and standardised treatment procedures in tertiary care facilities. Age under six months, preterm, passive smoking, hypoxemia, and increased C-reactive protein were found to be independent predictors of severe bronchiolitis using multivariate logistic regression. Early risk categorisation, monitoring prioritisation, prompt referral to intensive care when needed, and resource optimisation are all made possible by the identification of these high-risk characteristics. Decision-making may be enhanced and morbidity may be decreased by including these predictors into clinical evaluation [7].

This study's prospective design, comparatively high sample size, multicenter involvement, and thorough assessment of sociodemographic, clinical, laboratory, and outcome factors are among its strong points. However, it is important to recognise some limits. Etiological confirmation was not possible since viral identification by polymerase chain reaction (PCR) was not frequently carried out. The study did not address long-term respiratory consequences like recurrent wheeze or the later development of asthma. Furthermore, the results may not be as applicable to basic healthcare settings because the study was carried out in tertiary care facilities [8].

Overall, the current study shows that acute bronchiolitis is still a major cause of hospitalisation for infants, but that early diagnosis, evidence-based supportive care, and timely identification of high-risk patients in need of intensive monitoring can lead to positive short-term outcomes. Preventive measures that focus on environmental and socioeconomic risk factors that may be changed are expected to further lower the burden of disease and enhance the health of children.

Conclusion

Acute bronchiolitis primarily affects infants younger than six months, especially males from rural and poorer socioeconomic backgrounds, according to the current prospective observational study. Important risk factors for the occurrence and severity of the disease were found to include prematurity, low birth weight, lack of exclusive breastfeeding, exposure to indoor biomass fuel, passive tobacco smoke, and incomplete immunisation. Clinically, the most prevalent presenting symptoms were cough, tachypnea, wheezing, chest retractions, and difficulties feeding; severe illness was closely correlated with hypoxemia and high inflammatory markers.

The great majority of patients recovered successfully with supportive care, which included oxygen therapy, hydration, and close clinical monitoring. There was also relatively little need for intensive care and very little mortality. Early risk assessment and timely intervention are crucial since hypoxemia, age under six months, preterm, passive smoking, and increased C-reactive protein were found to be independent predictors of severe bronchiolitis.

The results emphasise the necessity of bolstering preventative measures by encouraging exclusive breastfeeding, lowering exposure to ambient tobacco smoke, increasing vaccination rates, and identifying high-risk infants at the primary healthcare level early on. This multicenter prospective study offers important information about the socio-clinical characteristics and short-term outcomes of acute bronchiolitis in eastern India, despite drawbacks like the lack of routine viral identification and long-term follow-up. To further enhance evidence-based management and maximise paediatric healthcare outcomes, future multicenter studies that include virological testing and long-term respiratory follow-up are advised.

References

1. Profile C, Acute OF, In B, Of C. Sociodemographic, Clinical Profile of Acute

Bronchiolitis In Children Of 1month To 24 Months Admitted In A Tertiary Care Centre. World J Curr Med Pharm Res. 2026;8(1):49–53.
2. Vantaku Venkata Vijayalakshmi, D Manikyamba, B Rambabu HV. A Study of Clinical Profile and Outcome of Bronchiolitis in Children of Age 1 – 24 Months at A Tertiary Care Hospital in South India. Int J Med Pharm Res. 2026;7(2):557–64.
3. Alcolea S, Alonso-l P, Mart C, Hurtado-gallego J, Calvo C. Antibiotic Utilization in Hospitalized Children with Bronchiolitis : A Prospective Study Investigating Clinical and Epidemiological Characteristics at a Secondary Hospital in. Pathogens. 2023;12(1397):1–12.
4. Masarweh K, Gur M, Leiba R, Bar-yoseph R, Toukan Y, Nir V, et al. Factors predicting length of stay in bronchiolitis. Respir Med [Internet]. 2020;161(November 2019):105824. Available from: https://doi.org/10.1016/j.rmed.2019.105824
5. Tarik SA, Islam O, Islam MD. Clinical features and outcomes of bronchiolitis in children : A prospective study. Intern ional J Pediatr Neonatol. 2025;7(1):94–8.
6. Ali MA, Patra CS, Parida S, Dash D, Maheshwari S, Mohanty DD, et al. Assessment of socio-clinical and laboratory profile and short-term outcome among acute bronchiolitis children between 1–24 months in a tertiary care hospital: A prospective descriptive study. SJ Pediatr Child Heal Africa. 2026;3(2):1–13.
7. Premkumar B, Elizabeth J. Clinical Profile and Outcome of Bronchiolitis in Children With 1-24 Months of Age. Cureus. 2024;16(9):1–6.
8. Vikas S, Angurana SK, Muralidharan J, Craig S, Santhanam I. Survey of Practice Variations in Management of Acute Viral Bronchiolitis in India (PRERNI-PAVB Survey). Indian J Crit Care Med. 2026;30(6):523–9.