

Clinical Trajectory and Development of Children Diagnosed with Bronchiolitis Transferred to a Tertiary Hospital

Trajetória Clínica e Desenvolvimento das Crianças com Diagnóstico de Bronquiolite Transferidas para um Hospital Terciário
Trayectoria Clínica y Desarrollo de Niños con Diagnóstico de Bronquiolitis Traslados a un Hospital de Tercer Nivel

RESUMO

Objetivo: identificar e analisar a trajetória clínica e desenvolvimento das crianças com diagnóstico de bronquiolite transferidas para um hospital terciário. **Método:** trata-se de um estudo retrospectivo, observacional, descritivo, do tipo corte transversal com abordagem quantitativa que foi realizada na unidade de pronto socorro em um município do noroeste paulista, por meio da revisão de prontuários. Foram consideradas crianças de 0 a 11 anos e 29 dias, entre 01 de janeiro de 2025 a 31 de maio de 2025 transferidos para um hospital terciário. **Resultados:** cerca de 105 crianças tiveram o diagnóstico de bronquiolite e foram transferidas para um hospital terciário, o maior número de transferências ocorreram entre a idade de 1 a 5 meses, com o início dos sintomas entre 1 e 3 dias, a tosse estava presente em 94,3% dos casos, e ainda o diagnóstico para detecção do vírus sincicial respiratório, foram positivos em 61 (58,1%) pacientes. **Conclusão:** A bronquiolite continua sendo uma patologia que causa um nível significativo de atendimentos nos serviços de urgência e internações hospitalares, gerando demandas consideráveis assistenciais.

DESCRIPTORES: Bronquiolite; Hospitalização; Criança e Procedimentos Clínicos

ABSTRACT

Objective: To identify and analyze the clinical trajectory and development of children diagnosed with bronchiolitis and transferred to a tertiary hospital. **Method:** This was a retrospective, observational, descriptive, cross-sectional study with a quantitative approach. It was conducted in an emergency room in a municipality in northwestern São Paulo state, through medical record review. Children aged 0 to 11 years and 29 days, transferred to a tertiary hospital between January 1, 2025, and May 31, 2025, were included. **Results:** Approximately 105 children were diagnosed with bronchiolitis and transferred to a tertiary hospital. The largest number of transfers occurred between the ages of 1 and 5 months. Symptom onset was between 1 and 3 days, and cough was present in 94.3% of cases. The diagnostic test for respiratory syncytial virus detection was positive in 61 (58.1%) patients. **Conclusion:** Bronchiolitis continues to be a pathology that causes a significant level of emergency room visits and hospital admissions, generating considerable healthcare demands.

DESCRIPTORS: Bronchiolitis; Hospitalization; Childhood and Clinical Procedures

RESUMEN

Objetivo: Identificar y analizar la trayectoria clínica y el desarrollo de niños con diagnóstico de bronquiolitis y transferidos a un hospital terciario. **Método:** Estudio retrospectivo, observacional, descriptivo y transversal con enfoque cuantitativo. Se realizó en un servicio de emergencia de un municipio del noroeste del estado de São Paulo, mediante revisión de historias clínicas. Se incluyeron niños de 0 a 11 años y 29 días, transferidos a un hospital terciario entre el 1 de enero de 2025 y el 31 de mayo de 2025. **Resultados:** Aproximadamente 105 niños fueron diagnosticados con bronquiolitis y transferidos a un hospital terciario. El mayor número de transferencias ocurrió entre las edades de 1 y 5 meses. El inicio de los síntomas fue entre 1 y 3 días, y la tos estuvo presente en el 94,3% de los casos. La prueba diagnóstica para la detección del virus respiratorio sincicial fue positiva en 61 (58,1%) pacientes. **Conclusión:** La bronquiolitis continúa siendo una afección que causa un número significativo de visitas a urgencias e ingresos hospitalarios, lo que genera una considerable demanda de atención médica.

DESCRIPTORES: Bronquiolitis; Hospitalización; Infancia y Procedimientos Clínicos

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Kayque Domingos Vitalino
Medical student, Penápolis Educational Foundation
ORCID: <https://orcid.org/0009-0003-5385-5192>

Mirelle dos Santos Ferreira
Undergraduate student in Nursing, Penápolis Educational Foundation
ORCID: <https://orcid.org/0009-0005-6525-4559>

Jhonata Carlos Pereira Ribeiro
Undergraduate student in Nursing, Penápolis Educational Foundation
ORCID: <https://orcid.org/0009-0003-4214-1098>

Luiz Antônio Domingues Júnior
Undergraduate student in Nursing, Penápolis Educational Foundation
ORCID: <https://orcid.org/0009-0002-9686-4438>

Kaylane de Oliveira Lopes
Undergraduate student in Nursing, Penápolis Educational Foundation
ORCID: <https://orcid.org/0009-0005-5763-8931>

Raianny Gallinari Carvalho
Undergraduate student in Nursing, Penápolis Educational Foundation
ORCID: <https://orcid.org/0009-0009-5655-5471>

Sabrina Ramires Sakamoto
Nurse Doctor, Penápolis Educational Foundation
ORCID: <https://orcid.org/0000-0003-0189-7043>

Leonardo Aparecido Teixeira Bentin*
Nurse Doctor, Penápolis Educational Foundation
ORCID: <https://orcid.org/0000-0002-6719-3375>

INTRODUCTION

Viral bronchiolitis stands out as one of the main diseases affecting children in the first years of life, being responsible for a high incidence of lower respiratory tract infections in children under two years of age, and this condition is predominantly associated with viral etiology, representing an important challenge for pediatric public health due to its frequency and potential severity in the most severe cases⁽¹⁾. It constitutes a lower respiratory tract infection characterized by involvement of the bronchi, resulting in relevant morphofunctional alterations, such as thickening of the mucosa, desquamation of the pseudostratified ciliated columnar respiratory epithelium and acute denaturation of the basement membrane⁽²⁾.

Its etiology is mostly viral, with respiratory syncytial virus (RSV) being identified as the agent responsible for

up to 75% of cases, other viral species, such as rhinovirus, parainfluenza virus and influenza virus, also contribute significantly to the occurrence of the disease, reinforcing the importance of epidemiological surveillance and accurate etiological diagnosis in the clinical management of respiratory infections in pediatric populations under 12 months of age^(2,3).

The initial clinical picture of acute bronchiolitis is characterized by symptoms typical of viral infection of the upper respiratory tract, such as fever and runny nose, and within four to six days, the infectious process progresses to the lower respiratory tract, manifesting as persistent cough and wheezing, which reflects the progressive involvement of the ventilatory system and marks the evolution of the disease to more severe forms⁽⁴⁾. Although the clinical course is, in most cases, self-limiting, there is a risk of progression to severe respiratory failure, especially in patients with sus-

ceptibility factors, and support may be needed in more complex contexts⁽⁵⁾. Laboratory tests performed during the course of acute viral bronchiolitis have low specificity for diagnosis; chest radiography, when indicated, reveals characteristic findings, such as pulmonary hyperinflation associated with interstitial infiltrates of varying intensity, which reflect the involvement of the airways and lung parenchyma observed in the disease⁽⁵⁻⁷⁾.

Given this context, lower respiratory tract infections in infants are associated with significant morbidity, and assessing the prevalence of respiratory viruses becomes fundamental for a deeper understanding of the epidemiological characteristics of these infections^(8,9). Therefore, the objective of this study was to identify and analyze the clinical trajectory and development of children diagnosed with bronchiolitis transferred to a tertiary hospital.

MATERIALS AND METHODS

This is a retrospective, observational, descriptive, cross-sectional study with a quantitative approach, conducted in the emergency room of a municipality in northwestern São Paulo state, through a review of medical records. Children aged 0 to 11 years and 29 days, transferred to a tertiary hospital between January 1st and May 31st, 2025, were considered. The group consisted of patients who met the criteria for a clinical diagnosis of bronchiolitis, recorded in their medical records with the International Classification of Diseases code. The variables studied included sociodemographic data such as age range, sex, and origin. Furthermore, clinical variables were analyzed, such as clinical signs like fever, runny nose, headache, cough, nasal congestion, dyspnea, fatigue, noisy breathing, vomiting, respiratory distress, other symptoms, and comorbidities. Evaluation of the respiratory system, diagnostic bases, care management, and signs of worsening were also studied. The data were collected from medical records using a form specifically designed for this research. After collection, the data obtained were coded in a standard way and compiled into a spreadsheet in Microsoft Office Excel version 2024. Descriptive analyses were performed (frequencies and absolute numbers) and were presented in graphs and tables for better understanding.

The study was submitted to and approved by the Research Ethics Committee of the Penápolis Educational Foundation - FUNEPE under CAAE No. 90818325.1.0000.0135.

RESULTS AND DISCUSSION

Focusing on supportive measures and preventive interventions, the management of bronchiolitis has been widely discussed. During the

analyzed period, approximately 105 children were diagnosed with bronchiolitis and transferred to a tertiary hospital. In Graph 1, the age range with the highest number of transfers was 1 to 5 months with 52 transfers (49.5%), followed by 6 to 11 months (29 transfers – 27.6%), 1 to 2 years (16 transfers – 15.2%), 0 to 30 days (7 transfers – 6.7%), and children over 3 years old with 1 transfer, corresponding to 1%. The data presented reveal a clear and compelling epidemiological profile regarding the severity of bronchiolitis in young infants, requiring tertiary level care. It is observed that the condition is most prevalent in the first year of life, this group representing more than 80% of all transfers, confirming that bronchiolitis, in its most severe forms, is a disease that primarily affects children in the first year of life. Vulnerability is multifactorial; physiologically, the airways have a small caliber and are more susceptible to obstruction by edema, mucus, and cellular debris; and immunologically, coinciding with the decline of passively transferred maternal antibodies and the immaturity of the child's own immune system, which tends to mount an exacerbated and less effective inflammatory response against viral pathogens⁽¹⁰⁾. Similar findings were found in the epidemiological study of bronchiolitis and acute bronchitis in children in the South of the country between 2019 and 2023, which characterized hospitalizations in children under 1 year of age⁽¹¹⁾. Another study also obtained the same result, analyzing hospitalization for acute bronchiolitis as a risk factor for recurrent wheezing⁽¹²⁾. Therefore, the concentration of cases requiring transfer to a tertiary hospital, as observed, reflects not only the incidence of the disease, but also the identification of patients at higher risk of clinical deterioration. At the other extreme, the drastic reduction in the number of cases after the first

year of life is expected and reflects the anatomical and immunological development of the child, such as the increase in the caliber of the airways and the maturation of the immune system, respiratory virus infections tend to manifest as milder conditions, similar to common colds, rarely requiring hospitalization, except in children with significant underlying comorbidities⁽¹³⁾.

The predominance of males among children transferred to the tertiary hospital, observed in our study (54.3% male vs. 45.7% female), is consistent with recent epidemiological findings^(14,15). However, it is important to reiterate that bronchiolitis is not exclusive to one sex, as illustrated by specific research conducted in different regional contexts. A study conducted to analyze the profile of hospitalizations and deaths due to bronchiolitis in the State of Amapá, for example, identified a predominance of females in its sample, demonstrating the epidemiological variability of the disease according to the population analyzed and possible associated social and environmental factors; in contrast, the study that evaluated the epidemiology of acute viral bronchiolitis in hospitalized infants, carried out by Flores and colleagues, showed that males were more prevalent than females^(16,17). These findings reinforce the need for preventive interventions and broadly targeted management strategies, regardless of sex, since both groups are significantly affected and may require specialized hospital support. The literature highlights that factors such as environmental exposure, family history, and age of symptom onset may be more relevant determinants of the severity and progression of bronchiolitis than the child's sex itself⁽¹⁸⁾.

The analysis of symptom onset in children with bronchiolitis, evidenced in the study, is consistent with the incubation period of viral bron-

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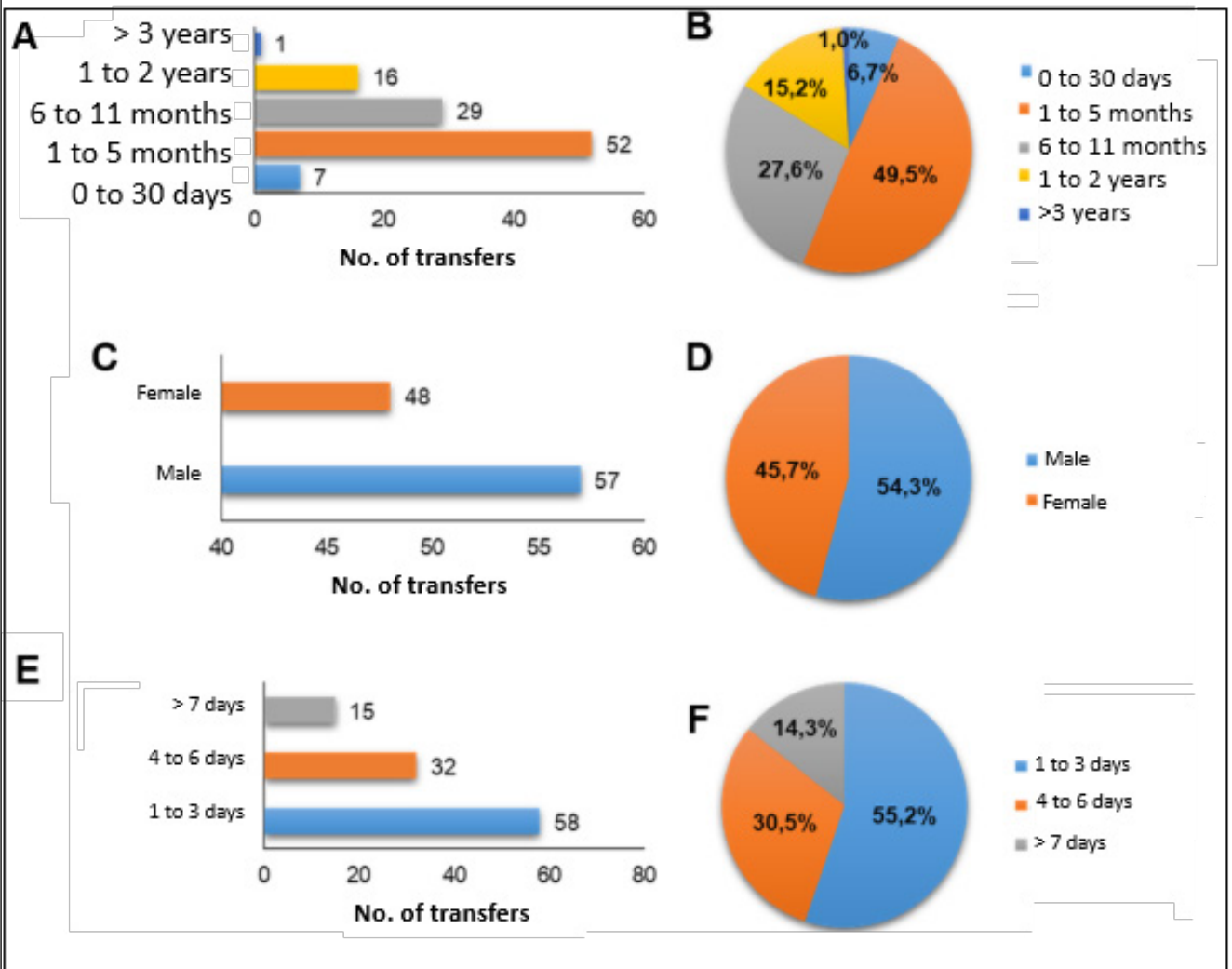
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chiolitis, evidenced in studies that indicate that, after inoculation, the patient goes through an asymptomatic phase known as the incubation period, which occurs between 4 and 5 days, followed by the appearance of

typical symptoms, such as runny nose, nasal congestion, fever and, in more severe cases, hypoxia, reinforcing the need for attention to clinical management and decisions about hospital transfers^(18–20). This assessment is

crucial for indicating early respiratory support measures and for recognizing signs of worsening, ensuring that the patient is promptly referred to more complex units.

Gráfico 01- Características demográficas e início dos sintomas das crianças com diagnóstico de bronquiolite transferidas para um hospital terciário, entre janeiro e maio de 2025.



A: Number of transfers according to age groups, B: Percentage of transfers according to age groups, C: Number of transfers according to sex, D: Percentage of transfers according to sex, E: Number of transfers according to symptom onset and F: Percentage of transfers according to symptom onset.

The clinical manifestations observed present characteristics of upper respiratory tract infections, with findings of fever, cough and nasal congestion, which during the progressive evolution of the disease, tend to worsen with respiratory discomfort,

productive cough and hyperthermia⁽²¹⁾. In the study that evaluated the clinical approaches to acute bronchiolitis in the current pediatric context, they identified that it is routine to identify in patients with symptomatology associated with bronchiolitis,

a variety of manifestations, including fever, cough, tachypnea, respiratory difficulties and also episodes of vomiting⁽²²⁾. This suggests a similarity in the data (Table 01) obtained from the presence of symptoms in patients,

where cough was present in 94.3% of cases, approximately 99 patients, and fever in 79 cases (72.2%), runny nose in 75 cases (71.4%), respiratory discomfort was present in 69 cases, approximately 65.7%, as well as dyspnea

in 35 patients (33.3%) and vomiting in 25 cases (23.8%), while fatigue, noisy breathing, and diarrhea were present in fewer than 10 cases.

Table 01 - Presence of symptoms, characteristics of lung auscultation, and comorbidities presented by children diagnosed with bronchiolitis transferred to a tertiary hospital between January and May 2025.

VARIABLES	n (105)	%
SYMPTOMS		
Cough	99	94,3%
Fever	79	75,2%
Runny nose	75	71,4%
Respiratory discomfort	69	65,7%
Dyspnea	35	33,3%
Nasal congestion	27	25,7%
Vomiting	25	23,8%
Fatigue	9	8,6%
Noisy breathing	8	7,6%
Diarrhea	7	6,7%
LUNG AUSCULTATION		
Adventitious Noises (Wheezes)	96	91,4%
Vesicular Murmurs	90	85,7%
COMORBIDITIES		
Prematurity	4	3,8%
Asthma	2	1,9%

The clinical pattern presented in the cases reviewed in the study included, among the most common signs, adventitious sounds (wheezing) and vesicular murmur, suggesting an intense inflammatory process in the lower airways. Due to the smaller size of children's airways compared to adults, the inflammatory process of bronchiolitis can cause airway obstruction, leading to more severe symptoms such as respiratory distress, the presence of pulmonary adventitious sounds such as wheezing, and altered airflow to the lungs⁽²³⁾. Similar results were found in the study that evaluated the epidemiological pro-

file of infant mortality from respiratory diseases in Brazil⁽²⁴⁾.

In addition, the present study identified prematurity as a comorbidity in 3.8% of cases, and asthma in 1.9%. The association between prematurity and bronchiolitis has been widely discussed, and studies indicate that premature infants have a significantly higher risk for bronchiolitis, with high hospitalization rates and severity resulting from the immaturity of the immune system and airways. According to the study by Prado and Novais (2025), where they described that there are reports of a close association between prematurity

and bronchiolitis, suggesting that prematurity increases the risk of babies acquiring acute viral bronchiolitis by 7 times⁽²⁵⁾.

To support the differential findings (Table 02), chest X-ray examinations were performed in 90.5% of cases, about 95 children, which suggests that due to the presence of fever in the patients, the professional sought the presence of secondary pulmonary infections, as also described in the study that evaluated the treatment used in cases of acute viral bronchiolitis diagnosed in the pediatric emergency room⁽²⁶⁾.

Table 02 - Tests performed to support medical diagnoses of children with bronchiolitis transferred to a tertiary hospital between January and May 2025.

VARIABLES	n (105)	%
IMAGING EXAMINATION		
Chest X-ray	95	90,5%
RT - RSV		
Reactive	61	58,1%
Non-Reactive	13	12,4%
RT - COVID-19		
Reactive	3	2,9%
Non-Reactive	60	57,1%
RT - INFLUENZA A and B		
Reactive	1	1,0%
Non-Reactive	37	35,2%

TR – Rapid immunochromatographic test.

The success of antiretroviral therapy depends on early diagnosis⁽²⁷⁾. Rapid immunochromatographic tests for respiratory syncytial virus detection were performed on 61 (58.1%) patients, with a reactive result and 13 cases (12.4%) with a non-reactive result. Tests for SARS-CoV-2 virus

detection were also performed, with 3 cases (2.9%) with a reactive result and 60 cases (57.1%) with a non-reactive result. The presence of influenza A and B was also tested, with 37 cases (35.2%) non-reactive and 1 case (1.0%) reactive. Rapid tests for immunochromatographic antigen detection allow for immediate decision-making

regarding the introduction of treatment and infection control measures, similar findings to those found in the study that evaluated the prognosis of hospitalized children under 2 years of age with co-detection of influenza A and respiratory syncytial virus at the point of care⁽²⁶⁾.

Tabela 03 - Pharmacological management used by children diagnosed with bronchiolitis transferred to a tertiary hospital, between January and May 2025.

VARIABLES	n (105)	%
β2-AGONIST		
Salbutamol	97	92,4%
CORTICOSTEROIDS		
Methylprednisolone	85	81,0%
Prednisolone	34	32,4%
ANTIBIOTICS		
Amoxicillin and Clavulanate	16	15,2%
Azithromycin	7	6,7%
Amoxicillin	7	6,7%
Ceftriaxone	4	3,8%
Cephalothin	2	1,9%
ANTIPYRETICS		
Dipyron	28	26,7%
Paracetamol	26	24,8%
Ibuprofen	2	1,9%

For drug management (Table 03) of the cases, the beta-antagonist salbutamol was used in 97 cases (92.4%), and the corticosteroids methylprednisolone in 85 patients (81.0%) and prednisolone in 34 children (32.4%). For secondary infectious treatment, clavulanate associated with amoxicillin was the predominant choice in 16 cases (15.2%), followed by azithromycin and amoxicillin with 7 cases each (6.7%), ceftriaxone with 4 cases (3.8%) and cefalothin with 2 cases (1.9%). And for antipyretic treat-

ment, dipyrone was present in 28 cases (26.7%), paracetamol in 26 cases (24.8%) and ibuprofen was chosen in 2 cases (1.9%).

Although their effectiveness may vary depending on the study and context, pharmacological treatments for bronchiolitis have largely focused on the use of bronchodilators, corticosteroids, antibiotics, and immunomodulatory agents⁽²⁸⁾. However, there is little conclusive evidence for an effective therapeutic approach to improve the disease; however, supportive ther-

apy should be based on ensuring good hydration and oxygenation. Therefore, there are few therapeutic proposals described, reflecting the lack of evidence for a single effective treatment, as demonstrated in studies that evaluated treatments used in cases of acute viral bronchiolitis in the pediatric emergency room⁽²⁰⁾ and also in the literature review that analyzed the epidemiological, pathophysiological, and therapeutic management aspects of viral bronchiolitis⁽²⁹⁾.

Table 04 - Use of oxygen therapy, clinical management, and signs of severity presented by children diagnosed with bronchiolitis transferred to a tertiary hospital, between January and May 2025.

VARIABLES	n (105)	%
OXYGEN THERAPY		
Nasal Cannula	73	69,5%
Venturi Mask	15	14,3%
Mask with Reservoir	3	2,9%
CLINICAL MANAGEMENT		
Nasal Irrigation with 0.9% Saline Solution	86	81,9%
Inhalation with 0.9% Saline Solution	86	81,9%
Volume Expansion	40	38,1%
SIGNS OF SEVERITY		
Tachypnea	67	63,8%
Use of Accessory Muscles	57	54,3%
Suprascular Retraction	17	16,2%
Nasal Flaring	5	4,8%
Agitation	3	2,9%
Grunting	3	2,9%
Prostration	3	2,9%
Cyanosis	1	1,0%
Intubation	1	1,0%

Oxygen supplementation was used in 69.5% (73 cases), followed by Venturi masks in 15 cases (14%) and reservoir masks in 3 cases (2.9%). Regarding clinical management, nasal lavage and inhalation with 0.09% saline solution occurred in 86 cases (81.9%), and volume expansion was used in 40 patients (38.1%), as described in Table 4. A prospective cohort study evaluating the epide-

miology of acute viral bronchiolitis in hospitalized infants demonstrated that hypertonic saline solution has been widely studied and used as a therapeutic intervention, indicating the inhalation of hypertonic saline solution to help reduce mucus viscosity and improve ciliary function, facilitating expectoration and relieving bronchial obstruction. The literature review on acute viral bronchiolitis

showed that nasal irrigation with saline solution is relevant for clearing the airways in mild cases and is recommended before oral feeding and in cases of nasal obstruction, and oxygen therapy is an option when saturation is below 92%, with non-invasive devices being used to supplement oxygen flow.

Tachypnea has recently been recognized as one of the signs associated

with disease severity, even in younger infants, indicating impaired gas exchange⁽³⁰⁾. Among the signs of severity, tachypnea occurred in 67 cases (63.8%), and the use of accessory muscles during breathing occurred in 57 children (54.3%), surpassing other symptoms of severity, such as supra-sternal retraction in 17 cases (16.2%), nasal flaring in 5 cases (4.8%), agitation, grunting, prostration in 3 cases (2.9%), 1 child presented with cyanosis, and 1 case required orotracheal intubation (1.0%). The early appearance of these signs of severity suggests that, often accompanied by wheezing as discussed previously, decreased oxygen saturation, use of accessory muscles, and nasal flaring may be linked

to lower airway obstruction caused by the inflammatory process and mucus accumulation, validating the clinical profile observed in our sample. Similar manifestations were found in the study that analyzed symptoms, clinical signs, and oxygen support in patients with bronchiolitis, corroborating the findings of this study, such as tachypnea, use of accessory respiratory muscles, and nasal flaring.

CONCLUSION

Bronchiolitis remains a pathology that causes a significant number of emergency room visits and hospitalizations, generating considerable healthcare demands. Although up-

dated clinical management practices exist, there is a lack of effective therapies, often resulting in prolonged hospital stays. It is imperative that current efforts focus on strategies that improve the training of health-care professionals regarding scientific evidence, aiming to reduce the adoption of practices that offer benefits to pediatric patients with bronchiolitis. This study demonstrated the epidemiological profile of affected patients, contributing to the identification of relevant variables for future investigations. Thus, it is essential to conduct more in-depth studies to ensure the continuous updating of bronchiolitis management.

REFERENCES

1. Prado SI, Novais MAP. Internações pediátricas por bronquiolite no Brasil: caracterização longitudinal e gastos hospitalares. *Acta Paulista de Enfermagem*. 2024;37:eAPE00876.
2. Santos DS, Neves SAS, Moccasin AS. Morbiletalidade por bronquite e bronquiolite aguda em crianças menores de um ano: estudo nacional de série histórica, 2013-2022. *Research, Society and Development*. 2023;12(9):e0512943143-e0512943143.
3. Lima R. Bronquiolite aguda. *Life Saving: Separata Científica*. 2021;8(19):50-5.
4. Carvalho WB, Johnston C, Fonseca MC. Bronquiolite aguda, uma revisão atualizada. *Rev Assoc Med Bras*. 2007;53:182-8.
5. Bonnet D, Schmaltz AA, Feltes TF. Infection by the respiratory syncytial virus in infants and young children at high risk. *Cardiol Young*. 2005;15(3):256-65.
6. Ferlini R, Pinheiro FO, Andreolio C, Carvalho PRA, Piva JP. Características e evolução de crianças com bronquiolite viral aguda submetidas à ventilação mecânica. *Rev Bras Ter Intensiva*. 2016;28:55-61.
7. Lubrano R, Cecchetti C, Elli M, Tomasello C, Guido G, Di Nardo M, Maciangelo R, Pasotti E, et al. Prognostic value of extravascular lung water index in critically ill children with acute respiratory failure. *Intensive Care Med*. 2011;37:124-31.
8. Miron D, Srugo I, Kra-Oz Z, Keness Y, Wolf D, Amirav I, Kassis I. Sole pathogen in acute bronchiolitis: is there a role for other organisms apart from respiratory syncytial virus? *Pediatr Infect Dis J*. 2010;29(1):e7-10.
9. Zalm MM, Uiterwaal CSPM, Wilbrink B, de Jong BM, Verheij TJM, Kimpen JLL, Ent CV. Respiratory pathogens in respiratory tract illnesses during the first year of life: a birth cohort study. *Pediatr Infect Dis J*. 2009;28(6):472-6.
10. Barbosa AVA, Talim AT, Porto VS, Freitas CM. Bronquite e Bronquiolite Aguda em crianças do Sul: Epidemiologia das internações entre 2019 e 2023. *Brazilian Jour-*

nal of Implantology and Health Sciences. 2024;6(9):753–64.

11. Albernaz EP, Menezes AMB, César JA, Victora CG, Barros FC. Hospitalização por bronquiolite aguda como fator de risco para sibilância recorrente. *Cad Saude Publica*. 2000;16:1049–57.

12. Flores D, Bachi A, França CN, Konstantyner T. Epidemiologic evaluation of acute viral bronchiolitis (AVB) in infants hospitalized. *Brazilian Journal of Global Health*. 2020;1(1):29–34.

13. Nogueira FGSB. Características clínico-epidemiológicas e fatores de risco associados a desfechos desfavoráveis em crianças hospitalizadas com síndrome respiratória aguda grave no estado do Amapá [tese]. Recife: Instituto de Medicina Integral Prof. Fernando Figueira – IMIP, 2024;

14. Reis BAC, Maynard LG. A Sazonalidade da bronquiolite em recém-nascidos e lactentes jovens como suporte diagnóstico e terapêutico. *Revista JRG de Estudos Acadêmicos*. 2024;7(14):e141080–e141080.

15. Peixoto FG, Filho JEBA, Medina AB, Silva GCB, Pedro IG, Carvalho ACV, Neves JPC, Stolerma TRC, et al. Bronquiolite viral aguda. *Revista Eletrônica Acervo Médico*. 2023 Dec 22;23(11):e14836.

16. Pinheiro FER, Araujo EO, Tavares GC, Furtado AFM, Rodrigues B de AN, Rizzi VB, Araújo HVS, Pio ARM, et al. Abordagens clínicas da bronquiolite aguda no âmbito atual pediátrico. *Brazilian Journal of Health Review*. 2024;7(1):5837–60.

17. Pediatría SA, Subcomisiones C. Recomendaciones para el manejo de las infecciones respiratorias agudas bajas en menores de 2 años. Resumen ejecutivo. *Arch Argent Pediatr*. 2015;113(4):373–4.

18. Dallabrida CP, Arraes FC, Ahn FMD, Pereira ME, Darte VMV, Silva Lima UT. Perfil epidemiológico da mortalidade infantil por doenças respiratórias no Brasil: bronquiolite, bronquite, asma e pneumonia. *Revista Ibero-Americana de Humanidades, Ciências e Educação*. 2025;11(7):453–65.

19. Prado SI, Novais MAP. Bronquiolite viral aguda no Brasil: características de tempo de internação e gastos hospitalares. *Cien Saude Colet*. 2025 Apr;30(4).

20. Ganan CS, Carpi MF, Correia GF, Martin JG. Avaliação do tratamento utilizado nos casos de bronquiolite viral aguda diagnosticados no pronto-socorro pediátrico. Acesso em. 2021;30(08):2024.

21. Debiaggi M, Canducci F, Ceresola ER, Clementi M. The role of infections and coinfections with newly identified and emerging respiratory viruses in children. *Virol J*. 2012;9(1):247.

22. Vieira NA, Müller SD. Bronquiolite na primeira infância: fisiopatologia e tratamento. *Revista Ibero-Americana de Humanidades, Ciências e Educação*. 2025 Jun 16;11(6):3397–421.

23. Ganan C, Carpi M, Correia G, Martin J. Evaluation of the treatment used in cases of acute viral bronchiolitis diagnosed in the pediatric emergency room. *Residência Pediátrica*. 2022;12(4).

24. Souza e Silva LL, Soares LP, Xavier AFV, Brandão MM, Simões SC, Chaves LP, Watanabe LH, MAcado AGF, et al. Bronquiolite viral: aspectos epidemiológicos, fisiopatológicos e manejo terapêutico. *Brazilian Journal of Development*. 2023 Mar 29;9(3):12351–61.

25. Lisboa DDJ, Niederauer F, Maraschin R. A influência da fisioterapia respiratória nos sinais clínicos em lactentes com bronquiolite viral aguda.