International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Original Article

A study of Acute Respiratory Infections among Under-five Children Admitted in a tertiary hospital in Central India

Dr Bhalchandra Falke[1], Dr. Vaibhav Kisanrao Aglawe[2], Dr. Pranay Gandhi[3]

[1]MD Paediatrics, Assistant Professor, Department of Paediatrics, KMSK, GMC, Chandrapur
[2]MBBS, MD (Respiratory Medicine), Assistant Professor, Department of Respiratory Medicine, KMSK, GMC, Chandrapur
[3]Assistant Professor, Dept. of community medicine, KMSK, GMC, Chandrapur

Corresponding Author:

Dr Bhalchandra Falke
MD Paediatrics, Assistant Professor, Department of Paediatrics, KMSK, GMC, Chandrapur

Received: 13-01-2026
Accepted: 30-01-2026
Available online: 16-02-2026

ABSTRACT

Introduction: Acute respiratory infection is a major cause of mortality and morbidity among under-five children in developing countries. Children under five years of age are most vulnerable to various common but treatable conditions. The objective of this study is to find the prevalence of acute respiratory infections among under-five hospitalized children in a tertiary hospital of central India.
Methods: This was a descriptive cross-sectional study conducted in a tertiary hospital of Central India from January 2024 to December 2025. Convenience sampling technique was used. Data was entered in the Microsoft excel sheet, then extracted and analyzed in the Statistical package of Social Sciences version 20. Point estimate at 95% Confidence Interval was calculated along with frequency and percentage and presented in tables and figures.
Results: Among 1320 children in our study, the prevalence of acute respiratory infection among hospitalized under-five children was 484 (36.67%) (32.99-40.34 at 95% Confidence Interval). Fever and cough were the most common presenting complaints among these children seen in 392 (81%) and 370 (76%) respectively. Stunting and wasting were seen in 74 (15%) and 52 (10.7%) of these children with acute respiratory infection while 12 (2.5%) of them were found overweight.
Conclusions: Acute respiratory infection is the most common reason for hospital admission among children under five years of age and the prevalence was high as compared to the standard study. The chief complaints are fever and cough.

Keywords*: acute respiratory infections, under five children.*

INTRODUCTION

Children under five years of age are most vulnerable to various common but treatable conditions.[1,2,3] Acute respiratory infection (ARI) which includes both upper respiratory tract infections (URTI) and lower respiratory tract infection (LRTI), accounts for up to 50% of hospital visits in children.[4] URTI such as common cold, pharyngitis, tonsillitis and otitis media also peak in this age. Pneumonia is the leading cause of mortality and morbidity in under-five children globally but its prevalence varies across the globe.[5-7]

ARIs are the major cause of mortality among children aged less than 5 years especially in developing countries. Worldwide, 20% mortality among children aged less than 5 years is attributed to respiratory tract infections (predominantly pneumonia associated). If we include the neonatal pneumonia also in the pool, the burden comes around to be 35-40% mortality among children aged less than 5 years accounting for 2.04 million deaths/year. Southeast Asia stands first in number for ARI incidence,[8] accounting for more than 80% of all incidences together with sub-Saharan African countries.[8] In India, more than 4 lakh deaths every year are due to pneumonia accounting for 13%-16% of all deaths in the pediatric hospital admissions.[7,8] Million deaths study based on the register general of India mortality statistics had reported 369,000 deaths due to pneumonia among children 1-59 months at the rate of 13.5/1000 live births. More number of deaths due to pneumonia was reported from central India.[9]

Therefore, this study was conducted with the aim to find the prevalence of acute respiratory infections among hospitalized children under five years of age.

METHODS

A descriptive cross-sectional study was conducted at Department of Pediatrics, in a tertiary hospital in Central India. Data was collected retrospectively from medical records of all the patients admitted from January 2024 to December 2025. Children between 2 months to 5 years of age were admitted to the pediatric ward through the emergency department, OPD or transferred from PICU were included. Medical records of incomplete information were excluded. Convenience sampling technique was used. The patient records of all of these children were used for the study.

A two-part semi-structured questionnaire was used to collect the data which included socio-demographic characteristics (age, gender, height and weight), and questionnaire related to morbidity. Patient record files were reviewed after taking verbal permission from the head of the department of pediatrics and medical record section in-charge.

In this study, acute respiratory infections were defined based on chief complaints, clinical examination and investigations including chest x-ray and included both upper and lower respiratory tract infections. Stunting and wasting were defined by measurement of height for age and weight for height respectively when Z score was less than minus 2 standard deviation (-2SD). These were graded as moderate and severe as per the WHO definition.[8] Overweight was defined when weight for height Z score was more than 2 standard deviations above median (+2SD).[1] Anemia in children was defined as hemoglobin value less than 110 mg/dl. Severity of anemia was graded as mild, moderate or severe.[8]

The data entered in the Microsoft Excel sheet. It was then analyzed using Statistical Package for the Social Sciences version 20. The result was obtained in frequency and percentage and presented in the tables and figures.

RESULTS

During the study period, 1320 patients below five years of age were admitted to the pediatric department. Study shows that the prevalence of ARI was 484 (36.67%) (32.99-40.34 at 95% Confidence Interval) among hospital admitted children. Almost two-thirds of these children were admitted from the emergency department and the rest from OPD.
Five most common clinical symptoms at presentation were fever, cough, running nose, difficulty breathing, and noisy breathing respectively (Table 1).

Most of the children with ARI were in the first year of life 226 (47%) followed by second 120 (25%) and third year 58 (12%) of life respectively with median age of 15 months (IQR: 30-8=22).

Majority of these children were male 344(71%). Median duration of hospital stay was 4 days (IQR: 5-2=3) with most of them 402 (83%) staying in hospital for 2-7 days. 52 (11%) children were discharged the other day of admission while only 30 (6%) of children stayed for more than 7 days in the hospital.

Stunting and wasting were seen in 74 (15%) and 52 (10.7%) of children while 12 (2.5%) of them were found overweight. Anemia was observed in almost 264 (54.5%) of the children, most of which were mild to moderate in severity (Table 2). The mean hemoglobin was 10.64±1.53 and the range was 15-5.9g/dl.

Tables

Table 1: **Main presenting symptoms at admission (multiple responses) (n = 484).**

Presenting Complaints	**n (%)**
Fever	392 (81)
Cough	370 (76)
Running nose	124 (26)
Loose stool	40 (8)
Vomiting	76 (16)
Difficulty breathing	116 (24)
Noisy breathing	64 (13)
Decreased feeding	14 (3)
Fast breathing	12 (2.5)

Table 2: Nutritional Profile of Under five children admitted in the Hospital with ARI (n = 484).

Nutritional status	**n (%)**
Stunting (Weight/age)	
Normal	410 (85)
Moderate	74 (15)

Wasting (Weight/Height)	
Normal	420 (87)
Moderate PEM	36 (7.4)
Severe PEM	16 (3.3)
Overweight	12 (2.4)
Anemia (Hb in g/dl)	
Severe (<7)	10 (2)
Moderate (7-9.9)	138 (28.5)
Mild (10-10.9)	116 (24)
Normal (≥11)	220 (45.5)

DISCUSSION

The present study revealed that the prevalence of acute respiratory infections in hospitalized children was 484 (37%) which makes it the most common reason for hospital admission in children under five year of age. This finding is in agreement with other studies done in community and hospital.[9,10] The same study states that 34% of children with symptoms of ARI sought treatment or advice from pharmacies which points towards the possibility of cases being under reported.

Recent community-based estimates from prospective study report 70% of the childhood morbidities among children aged less than 5 years are due to ARI.[11] While in developing country, a child is likely to have around 0.3 episodes of pneumonia/year, in developed countries it is 0.03 episodes per child/year.[10] On this basis, India is predicted to have over 700 million episodes of ARI and over 52 million episodes of pneumonia every year. A study from Haryana by Broor et al.,[12] had reported 2387, 536, and 43 episodes of acute upper respiratory infections, acute lower respiratory infections, and severe acute lower respiratory infections respectively per 1000 child years.

The most common presenting complaints among children with ARI, at the time of hospital admissions were fever and cough similar to study by Koirala R.[11]

In this study, the most common age of hospital admission was infancy. However, the number of children requiring hospital admission decreased as they grew older.[12]

Current study shows that male children were predominantly admitted compared to females. Similar findings were found in the study conducted by Joshi, et al.[13] and others.[13,14] This could be due to higher acceptance of parents to admit their sons compared to their daughters[15] but could also be due to the variable gender composition of the study population.[16]

The study also found that most of the children stayed in hospital for 2-7 days (83%), followed by those who were discharged after 1 day (11%). However, wasting 26 (10.7%) appears comparable to the result and also findings by Ujunwa , et al.[17,18] In a community-based study conducted in a village near to the current study place, stunting and wasting among children below five years was 37.3% and 25.7% respectively,[19] which is higher than the findings in this study. This means that the situation of malnutrition might be worse in the community than seen in this study.[20]

Anemia has also been stated as one of the risk factor for ARI among under five children[21] as it potentiates infection by weakening the immune system.[22] In this study, anemia was found in 132 (54.5%) of children which is similar to findings by Joshi, et al.[23] However, Sinha, et al. found quite lower prevalence of anemia (28%) among hospitalized children under five years of age[24] which was similar to other similar studies.[25, 26]

This was a single center retrospective study. So, a multi-centric prospective study could project the actual prevalence of the condition.

CONCLUSIONS

ARI is the most common illness among hospitalized children under five years of age. Among them, the most common presenting complaints are fever and cough. Stunting, wasting and anemia are common among these children.

REFERENCES

1. Amdekar YK, Lalwani SK, Bavdekar A, Balasubramanian S, Chhatwal J, Bhat SR, et al. Immunogenicity and Safety of a 13-Valent Pneumococcal Conjugate Vaccine in Healthy Infants and Toddlers Given with Routine Vaccines in India. Pediatr Infect Dis J. 2012
2. Ghimire PR, Agho KE, Ezeh OK, Renzaho AMN, Dibley M, Raynes-Greenow C. Under-Five Mortality and Associated Factors: Evidence from the Nepal Demographic and Health Survey (2001-2016). Int J Environ Res Public Health. 2019 Apr 8;16(7):1241.

3. World Health Organization (WHO). Children: Improving Survival and well-being [Internet]. Geneva: WHO; 2020. [2020 Sep]. [2021 Jul]. www.who.int/news-room/fact-sheets/detail/children-reducing-mortality
4. West TE, Goetghebuer T, Milligan P, Mulholland EK, Weber MW. Long-term morbidity and mortality following hypoxaemic lower respiratory tract infection in Gambian children. Bulletin of the World Health Organization. 1999;77(2):144.
5. Abubakar II, Tillmann T, Banerjee A. Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet. 2015 Jan 10;385(9963):117–71.
6. Wang H, Bhutta ZA, Coates MM, Coggeshall M, Dandona L, Diallo K, et al. Global, regional, national, and selected subnational levels of stillbirths, neonatal, infant, and under-5 mortality, 1980-2015: a systematic analysis for the Global Burden of Disease Study 2015. The Lancet. 2016 Oct 8;388(10053):1725–74.
7. Paudel K, Sharma S. Review of Paediatrics Inpatient at a Zonal Hospital. Journal of Nepal Paediatric Society. 2013 Feb 23;32(3):239–44.
8. 8.World Health Organization (WHO). Child Mortality and causes of death [Internet]. Geneva: World Health Organization; 2021. [2021 July 5;]. https://www.who.int/gho/child_health/mortality/mortality_under_five_text/en/
9. Sharma KR, Dawadi S, Upadhayaya P, Khanal VK, Singh SB. Morbidity Profile of Under Five Children Residing in Barbote Village Development Committee of Ilam District of Eastern Nepal. Birat Journal of Health Sciences. 2018;3(3):554–9.
10. Adhikari P, Kandel D, Shrestha U. Pattern of Pediatric Morbidity in Hospital Admitted Patients in Western Region of Nepal. Journal of Gandaki Medical College-Nepal. 2018 Aug 17;11(1):61–3.
11. Koirala R. Risk Factors of Acute Respiratory Infections in Children under Five Years Attending the Fishtail Hospital, Pokhara, Nepal. Journal of Gandaki Medical College-Nepal. 2019 Dec 31;12(2):74–9.
12. Broor S, Pandey RM, Ghosh M, Maitreyi RS, Lodha R, Singhal T, et al. Risk factors for severe acute lower respiratory tract infection under-five children. Indian Pediatr. 2001;38:1361–9.
13. Joshi P, Giri BR, Khatun N, Prajapati B, Chhetri ST. An audit of Pediatrics Inpatients in General Pediatrics Department of Tertiary Care Children's Hospital. Nepal Medical Journal. 2019 Oct 10;1(2):55–61.
14. Ahmad K, Faridi MMA, Srivastava G. Epidemiological characteristics, clinical profile and nutritional status of hospitalized under five children. International Journal of Community Medicine and Public Health. 2020 July;7(8):3111–8.
15. Ramawat P, Jain N. Morbidity and mortality profile of children admitted in pediatric department - A single center study. Asian Journal of Medical Sciences. 2021;12(5):94–100.
16. Pokhrel S, Snow R, Dong H, Hidayat B, Flessa S, Sauerborn R. Gender role and child health care utilization in Nepal. Health policy (Amsterdam, Netherlands). 2005 Sept 28;74(1):100–9.
17. Jain N, Lodha R, Kabra SK. Upper respiratory tract infections. Indian J Pediatr. 2001;68:1135–8.
18. Ujunwa F, Ezeonu C. Risk Factors for Acute Respiratory Tract Infections in Under-five Children in Enugu Southeast Nigeria. Ann Med Health Sci Res. 2014 Jan;4(1):95–9.
19. Sharma AK, Reddy DC, Dwivedi RR. Descriptive epidemiology of acute respiratory infections among under five children in an urban slum area. Indian J Public Health. 1999;43:156–9.
20. Acharya D, Prasanna KS, Nair S, Rao RS. Acute respiratory infections in children: A community based longitudinal study in south India. Indian J Public Health. 2003;47:7–13.
21. Malla T, Pathak OK, Malla KK. Is Low Hemoglobin Level a Risk Factor for Acute Lower Respiratory Tract Infections? Journal of Nepal Paediatric Society. 2010;30(1):1–7.
22. Joshi S, Pradhan M, Joshi U. Prevalence of anemia among children under five years in tertiary care hospital of Nepal. Medical Journal of Shree Birendra Hospital. 2014;13(1):33–6.
23. Sinha AK, Padmavathi P, Dubey RK, Gautam N, Archana J, Neupane Y. Prevalence of anemia amongst children under 59 months old in south western Nepal. International Journal of Pharmaceutical Sciences and Health Care. 2013 August;4(3):1–6.
24. Srinivasan MG, Ndeezi G, Mboijana CK, Kiguli S, Bimenya GS, Nankabirwa V, et al. Zinc adjunct therapy reduces case fatality in severe childhood pneumonia: A randomized double blind placebo-controlled trial. BMC Med. 2012;10:14
25. Sharma A, Giri A, Pudasaini S. Prevalence of anemia in children aged 6 months to 15 years: a hospital based study. Journal of Pathology of Nepal. 2017 Sept 1;7(2):1168–71.