



## A CROSS SECTIONAL STUDY ON LOWER RESPIRATORY TRACT INFECTIONS IN CHILDREN

### Paediatrics

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### ABSTRACT

**BACKGROUND:** Paediatric respiratory tract infections are one of the most common reasons for physician visits and hospitalization and are associated with significant morbidity and mortality. The World Health Organization (WHO) has suggested diagnosis and assessment of severity of ALRTI on the basis of clinical features and empirical antibiotics in all cases of ALRTI. This leads to administration of antibiotics to all children, including those with viral ALRTI. Concerns about unnecessary use of antibiotics for ALRTI have been expressed.

**objectives**To study the clinical presentation and diagnosis of acute lower respiratory tract infections in outpatient and hospitalized patient

**Material and Methods** The study was conducted in the Department of Pediatrics at Padmashree D Y Patil Hospital and Research Centre Kolhapur, Maharashtra. All the patients between 2 months to 5 years of age who attended the outpatient department with complaints of fever, cough, breathlessness, poor feeding with evidence of lower respiratory tract infection were included in the study. A detailed history was taken and a thorough physical examination performed. Three principal signs namely rapidity of breathing, chest indrawing and inability to feed were assessed. From this disease is classified as mild, moderate, severe and this determines therapeutic intervention

**RESULTS** During the study period there were 1043 patients admitted in the paediatric ward, out of which 207 admissions were of LRTI (19.8%). In our study there were a total of 453 patients suffering from LRTI. A total of 246 patients were treated on OPD basis and the rest of 207 (45.7%) needed hospitalization for their LRTI. There were 304 (67%) male and 149 (33%) female patients in our study. Based on the age distribution among the OPD patients there were 157 patients in the age group of <1, 52 patients in the age group of 1-3, and 37 in the age group of 3-5 years. Similarly, among the IPD patients there were 126, 68, and 13 patients in the age group of <1, 1-3 and 3-5 respectively. Based on the clinical features in our patients for LRTI, we found that 308 patients presented with cough. The other most common signs and symptoms found in our study in the decreasing order of frequency were: fever in 294, tachypnoea in 285 and chest indrawing in 267 of the patients. Stridor was found in 15 patients. Two hundred and thirty-one patients presented with poor feeding and crepitations were present in 144 patients. 350 patients were diagnosed as pneumonia, 68 had croup, 35 had bronchiolitis. Five patients presented with complications as empyema and pleural effusion.

**CONCLUSION:-** Most of the ALRTIs occurred in children below the age of 5 years (59.1%) than infants (40.9%). It was observed that more male children suffered from acute respiratory tract infections than female children. Clinically, majority of the children had a respiratory rate more than 50/min. which formed a reliable clinical marker.

### KEYWORDS

Lower Respiratory tract infections, cross sectional study

### INTRODUCTION:

ARIs are the most common causes of morbidity and mortality in children under five years of the age. These patients have an average of three to six episodes of ARIs annually regardless of where they live or what their economic situation is.<sup>(1,2)</sup>

Because of the differences in specific etiologies and risk factors, the severity of LRIs in children under five is worse in developing countries resulting in a higher case fatality rate. Although medical care can to some extent mitigate both severity and fatality, many severe LRIs do not respond to therapy largely because of the lack of highly effective antiviral drug. according to WHO studies a growing preschool child will have 6 to 8 episodes of ARI per year. The World Health Organization (WHO) estimates that 2 million children under five die of pneumonia each year<sup>(3)</sup> Acute lower respiratory tract infection (ALRTI) is the leading cause of mortality and a common cause of morbidity in children below five years of age<sup>(4)</sup>. The World Health Organization (WHO) has suggested diagnosis and assessment of severity of ALRTI on the basis of clinical features and empirical antibiotics in all cases of ALRTI. This leads to administration of antibiotics to all children, including those with viral ALRTI. Concerns about unnecessary use of antibiotics for ALRTI have been expressed<sup>(5)</sup>. Many published studies have addressed the differentiation of bacterial from viral ALRTI using clinical<sup>(6,7,8)</sup> radiological<sup>(9-17)</sup> and routine hematological investigations<sup>(6,7,18,19)</sup>. In India ARI form 20 to 40% of outpatient attendance and responsible for 12 to 35% of hospital admissions. one fifth of all deaths in children less than 5 years are due to ALRTI<sup>(20,21)</sup>.

### AIMS

To study the clinical presentation and diagnosis of acute lower respiratory tract infections in outpatient and hospitalized patients

### MATERIAL AND METHODS

A cross sectional study was conducted in the Department of Pediatrics at Padmashree D Y Patil Hospital and Research Centre Kolhapur, Maharashtra. All the patients between 2 months up to 5 years of age

who attended the outpatient department with complaints of fever, cough, breathlessness, poor feeding with evidence of lower respiratory tract infection were included in the study. A detailed history was taken and a thorough physical examination performed. The most widely used definition is based on pioneering work by Shann & colleagues in Papua New Guinea and was promulgated by WHO, it assesses three principal signs namely rapidity of breathing, chest indrawing and inability to feed. From this disease is classified as mild, moderate, severe and this determines therapeutic intervention. It has been subsequently modified to give different threshold for tachypnoea. Thus in children < 2 months threshold is 60 breaths/minute (bpm), in those 2-11 months it is 50 bpm and in those 1-4 yrs is 40 bpm. This greatly improves the sensitivity of case identification but does decrease specificity<sup>(22)</sup>. The second route is to base diagnosis on the individual paediatrician's experience and acumen using chest auscultation<sup>(23,24)</sup>. Rest of the patients were treated on outpatient basis..

### INCLUSION CRITERIA

All the patients between 2 months up to 5 years of age who attended the outpatient department with complaints of fever, cough, breathlessness, poor feeding with evidence of lower respiratory tract infection were included in the study.

### EXCLUSION CRITERIA

- Upper respiratory tract infections,
- Tuberculosis and other associated conditions like malaria, HIV were excluded from study

**RESULTS:-** This study "Clinical profile of acute lower respiratory tract infections in children from 2 months to 5 years of age."

was a cross sectional study conducted in the department of paediatrics from June 2007 to 2009. A total number of patients attending the OPD during this study period were 1576. Out of those 453 were suffering from LRTI. During the study period there were 1043 patients admitted in the paediatric ward, out of which 207 admissions were of LRTI (19.8%).

Table 1: Total no. and percentage of patients suffering from ALRTI

Total No. Of OPD Patients suffering from LRTI	Percentage of patients suffering from LRTI
1576	28.8%

Table 2: Number of patients hospitalized for LRTI

Total No. of IPD patients	No. of IPD patients Due to LRTI	Percentage
1043	207	19.8%

Thus, in our study there were a total of 453 patients suffering from LRTI. A total of 246 patients were treated on OPD basis and the rest of 207 (45.7%) needed hospitalization for their LRTI as shown in the following figure

Chart 1: OPD + IPD Patients

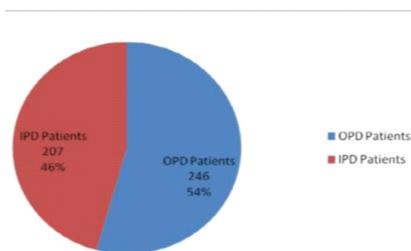


Table 2: Number of patients hospitalized for LRTI

Chart 1: OPD + IPD Patients

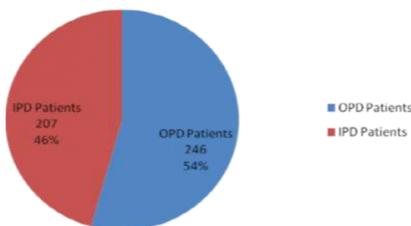


Table 2: Sex distribution of the patients

Total No. of Patients	Males	Females
453	267	186

Based on the age distribution among the OPD patients there were 157 patients in the age group of <1, 52 patients in the age group of 1-3, and 37 in the age group of 3-5 years.

Similarly, among the IPD patients there were 126, 68, and 13 patients in the age group of <1, 1-3 and 3-5 respectively

Table 3: Age distribution in the OPD patients suffering from LRTI

Age (Years)	No. of cases	Percentage (%)
<1	157	64
1-3	52	21
3-5	37	15

Table 4: Age distribution in the IPD patients suffering from LRTI

Age (Years)	No. of cases	Percentage (%)
<1	126	60.8
1-3	68	33
3-5	13	6.2

IPD patients No.

Table 5: Clinical features of the patients with LRTI

CLINICAL FEATURE	NO. OF PATIENTS	PERCENTAGE (%age)
Cough	308	68
Fever	294	65
Tachypnoea	285	63
Chest indrawing	267	59
Poor feeding	231	51
Crepitations	144	32
Rhonchi	140	31
Decreased air entry	130	38
Dullness/resonant	125/1	36.3/0.2
Stridor	15	3.3
Pain in chest	3	0.6

Table 6: Diagnosis of patients with LRTI

Diagnosis	Total No. of Cases	Percentage
Pneumonia	344	75.9
Croup	68	15
Bronchiolitis	35	7.7
Empyema	3	0.6
Pleural effusion	2	0.4
pneumothorax	1	0.2

**DISCUSSION**

Lower respiratory tract illness (asthma, bronchiolitis, bronchitis, croup, pneumonia) remains one of the major causes of childhood morbidity<sup>(25,26)</sup>. Special attention is directed at viral lower respiratory

tract illness (LRTI) in the first two years of life because the highest incidence's and rates of hospitalization for LRTI are found at this time, and because of the risk of chronic sequelae from LRTI in early childhood. one agent, respiratory syncytial virus (RSV), is particularly likely to cause LRTI in the first two years of life<sup>(27,28,29)</sup>. Observational evidence of an association between inadequate growth and the risk of experiencing or dying from For the proper management of patients with ALRTI, a history, clinical examination, chest x-ray<sup>(32)</sup> and identification of the offending organism and its sensitivity to antimicrobial medications are recommended. Facilities for identifying various organisms are almost lacking in underdeveloped countries, and are only available to some extent in rich developing countries. For countries with inadequate medical facilities, WHO has initiated a program for the clinical management and control of acute respiratory infections<sup>(30,31)</sup> which has resulted in the reduction of ALRTI mortality rates by 25%-67%<sup>91</sup>. For developing countries, guidelines for diagnosis and management of ALRTI based on chest x-ray and minor laboratory facilities are required. The present study was conducted with a view to examine the children less than 5 years of age with ALRI attending the paediatrics out patient department with special reference to clinical presentation and factors which are independent and modifiable such as immunization, nutrition and conditions of living. A total of 1576 OPD patients were included in the study, out of which 453 were suffering from LRTI (28.8%). During the study period there were 1043 hospitalizations in the above age group, out of which 207 admissions were related to LRTI (19.8%). All the patients were selected and worked up as per the pre-determined proforma. Children suffering from tuberculosis, URI and other associated conditions like malaria, HIV were excluded from the study.

The prevalence of ALRI in our study was 28.8%. Similar results mentioned in (bulletin of WHO 1984)<sup>(32)</sup>, M.R.savithia<sup>(18)</sup> et al where prevalence was 25%. In our study there were 267 (58.9%) male & 186(41.00%) female. In a study conducted by, M.R.savithia<sup>(18)</sup> et al in cheluvamba hospital among 208 patients, there were 133(63.9%) males & 75(36%) females. Among the patients who were treated on the OPD basis, There were 157 (64%) less than 1 year of age & 89 (36.1%) were in the age group of 1 to 5 years. Similar results in the study done by Tripura Padmaji Kanchichi<sup>(33)</sup> et al. at J.J.hospital Mumbai where 176 patients were enrolled.

## REFERENCES:-

- 1) Kamath, K. R., R. A. Feldman, P. S. S. Rao, and J. K. Webb. 1969. "Infection and Disease in a Group of South Indian Families." *American Journal of Epidemiology* 89: 375-83.
- 2) Monto, A. S., and B. M. Ullman. 1974. "Acute Respiratory Illness in an American Community: The Tecumseh Study." *Journal of the American Medical Association* 227 (2): 164-69.
- 3) Bryce J, C Boschi Pinto, K Shibuya, R E Black and the WHO Child Health Epidemiology Reference Group. 2005. WHO Estimates of the causes of Death in Children. *Lancet* 365:1147-52.
- 4) Mulholland EK. Magnitude of the problem of childhood pneumonia in developing countries. *Lancet* 1999; 354: 590-592.
- 5) Torzillo PJ. Wheezing and management algorithms for pneumonia in developing countries. *Indian Pediatr* 2001; 38: 821-823.
- 6) Turner RB, Lande AE, Chase P, Hilton N, Weinberg D. Pneumonia in pediatric outpatients: cause and clinical manifestations. *J Pediatrics* 1987; 111: 194-200.
- 7) Bettenay FAL, De Campo JF, McCrossin DB. Differentiating bacterial from viral pneumonias in children. *Pediatr Radiol* 1988; 18: 453-454.
- 8) Isaacs D. Problems in determining the etiology of community-acquired childhood pneumonia. *Pediatr Infect Dis J* 1989; 8: 143-148.
- 9) Courtoy I, Lande AE, Turner RB. Accuracy of radiographic differentiation of bacterial from nonbacterial pneumonia. *Clin Pediatr* 1989; 28: 261-264.
- 10) Tew J, Calenoff L, Berlin BS. Bacterial or nonbacterial pneumonia: Accuracy of radiographic diagnosis. *Radiology* 1977; 124: 607-612.
- 11) McCarthy PL, Spiesel SZ, Stashwick CA, Ablow RC, Masters SJ, Dolan TF Jr. Radiographic findings and etiologic diagnosis in ambulatory childhood pneumonias. *Clin Pediatr* 1981; 20: 686-691.
- 12) Swischuk LE, Hayden Jr CK. Viral vs bacterial pulmonary infections in children (is roentgenographic differentiation possible?). *Pediatr Radiol* 1986; 16: 278-284.
- 13) Korppi M, Kiekara O, Heiskanen-Kosma T, Soimakallio S. Comparison of radiological findings and microbial aetiology of childhood pneumonia. *Acta Paediatr* 1993; 82: 360-363.
- 14) Virkki R, Juven T, Rikalainen H, Svedstrom E, Mertsola J, Ruuskanen O. Differentiation of bacterial and viral pneumonia in children. *Thorax* 2002; 57: 438-441.
- 15) Shuttleworth DB, Charney E. Leukocyte count in childhood pneumonia. *Am J Dis Child* 1971; 122: 393-396.
- 16) Nohynek H, Valkeila E, Leinonen M, Eskola J. Erythrocyte sedimentation rate, white blood cell count and serum C-reactive protein in assessing etiologic diagnosis of acute lower respiratory infections in children. *Pediatr Infect Dis J* 1995; 14: 484-490.
- 17) Gupta S. *Diagnosis and Management of acute respiratory tract infections in the community*, 2nd edition, 47.
- 18) Savitha MR, Nandeeshwar M R et al modifiable risk factors for acute respiratory tract infections. *IJP* 2007 74(5):477-82
- 19) Pelletier DL, Frongillo EA jr, Habicht JP. Epidemiological evidence for a potentiating effect of malnutrition on child mortality. *Am J Public Health* 1993; 83: 113(0-3). PMID 8342721.
- 20) Ezzati M, Lopez AD, Rodgers A, Murray CJL. *Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors* Geneva WHO; 2004 PP39-161
- 21) Black R E, Allen LH, Bhutta ZA, et al Maternal and child undernutrition: global and regional exposures and health consequences *Lancet* 2008; 371: 243-60 PMID: 18207566
- 22) Shann, F., K. Hart, and D. Thomas. 1984. "Acute Lower Respiratory Tract Infections in

- Children: Possible Criteria for Selection of Patients for Antibiotic Therapy and Hospital Admission." *Bulletin of the World Health Organization* 62: 749-51
- 23) Lanata CF, Rudan I, Boschi pinto C et al Methodological and quality issues in epidemiological studies of acute lower respiratory infections in children in developing countries *Int J Epidemiol* 2004; 33: 1362-72.
- 24) Rudan I, Tomaskovic L, Boschi pinto C, Campbell H. Global estimates of the incidence of clinical pneumonia among children under five years of age. *Bull WHO*. 2004; 82: 895-903.
- 25) National Centre for Health Statistics, Cyprus BK. Patterns of ambulatory care in Pediatrics. National Ambulatory Medical Care Survey, United States, January 1980-December 1981. *Vital and Health Statistics, series 13, no. 75*. DHHS Pub. No. (PHS)84-1736. Washington, DC: Govt Printing Office, 1983.
- 26) Roghmann KJ, Hoekelman RA, Mccierny TK. The changing pattern of primary pediatric care: update for one community paediatrics 1984; 73: 363-374.
- 27) Foy HM, Cooney MK, Maletsky AJ et al: incidence and etiology of pneumonia, croup, and bronchiolitis in preschool children belonging to prepaid medical care group over a four year period *Am J Epidemiol* 1973; 97: 80
- 28) Berman S, Duerras A, Bedoya A, et al: Acute lower respiratory tract illness in Cali, Colombia: A two year ambulatory study. *Pediatrics* 1983; 71: 210-218
- 29) Mufson MA, Krause HE, Mocca HE et al. Viruses, mycoplasma Pneumoniae and bacteria associated with lower respiratory tract disease among infants. *Am J Epidemiol* 1970; 91: 192-202
- 30) Victora CG, Kirkwood BR, Ashworth A et al potential interventions for the prevention of childhood pneumonia in developing countries: improving nutrition. *Am J Clin Nutr* 1999; 309-20
- 31) Klein JO, The epidemiology of pneumococcal disease in infants and children. *Rev Infect Dis* 1981; 3: 246-53
- 32) World Health Organisation, A programme for controlling acute respiratory infections in children: A WHO memorandum *Bull WHO* 1984; 62: 47-58
- 33) Padmaji Kanchi et al 2005 A Hospital based observational study of acute respiratory tract infections and some associated epidemiological factors in children of 0-5 years of age group *Lancet*, 2005; 97, 130, 150