

## Original Research

### Evaluation of antibiotic prescribing pattern in lower respiratory tract infection among pediatric subjects of less than 5 years of age

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#### ABSTRACT:

**Background:** The common LRIs in children are pneumonia and bronchiolitis. The respiratory rate is a valuable clinical sign for diagnosing acute LRI in children who are coughing and breathing rapidly. Hence; under the light of above mentioned data, the present study was undertaken for evaluating the antibiotic prescribing pattern in lower respiratory tract infection among pediatric subjects of less than 5 years of age. **Materials & methods:** A total of 500 subjects of less than 5 years of age and with presence of lower respiratory tract infection were enrolled. Ethical approval was obtained from institutional ethical committee and written consent was obtained from the parents/guardians of all the patients after explaining in detail the entire research protocol. The data of each patient was collected in a specially designed case record form. The inpatient case records of admitted children were analyzed for the demographic data, diagnosis, duration of hospital stay, type of drug, dosage regimen, average number of drugs per encounter, percentage of encounters with an antibiotic prescribed and group wise prescription of antibiotics. **Results:** Total number of drugs prescribed was 2210. Average number of drugs per prescription was 4.42 while percentage of prescription with oral antibiotics was 96.15 percent. Cephalosporin, Penicillin, Aminoglycosides and Macrolides were prescribed in 37.33 percent, 36.11 percent, 25.75 percent and 5.06 percent of the patients. **Conclusion:** From the above results, the authors conclude that physicians and Doctors should be more aware on more appropriate and cost effective prescribing.

**Key words:** Antibiotic, Respiratory tract

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#### INTRODUCTION

The common LRIs in children are pneumonia and bronchiolitis. The respiratory rate is a valuable clinical sign for diagnosing acute LRI in children who are coughing and breathing rapidly. The presence of lower chest wall indrawing identifies more severe disease. Currently, the most common causes of viral LRIs are RSVs. They tend to be highly seasonal, unlike parainfluenza viruses, the next most common cause of viral LRIs. The epidemiology of influenza viruses in children in developing countries deserves urgent investigation because safe and effective vaccines are available. Before the effective use of measles vaccine, the measles virus was the most important viral cause of respiratory tract-related morbidity and mortality in children in developing countries.<sup>1-3</sup> Identifying patients benefitting from

antibiotic treatment among those not in need remains a major diagnostic challenge. Thus, physicians tend to err on the safe side and overuse antibiotics according to varied approaches as reflected in the different antibiotic prescription rates across countries and institutions. A better understanding of the decision to prescribe or withhold antibiotics is crucial for future restrictive treatment strategies. Factors leading to antibiotic prescription are known to be complex and are scarcely elucidated in the pediatric population.<sup>4-7</sup> Hence; under the light of above mentioned data, the present study was undertaken for evaluating the antibiotic prescribing pattern in lower respiratory tract infection among pediatric subjects of less than 5 years of age.

## MATERIALS & METHODS

The present study was undertaken for evaluating the antibiotic prescribing pattern in lower respiratory tract infection among pediatric subjects of less than 5 years of age. It was a prospective study carried within a time period of 10 months. The study was conducted in the department of paediatrics and pharmacology. A total of 500 subjects of less than 5 years of age and with presence of lower respiratory tract infection were enrolled. Ethical approval was obtained from institutional ethical committee and written consent was obtained from the parents/guardians of all the

patients after explaining in detail the entire research protocol. The data of each patient was collected in a specially designed case record form. The inpatient case records of admitted children were analyzed for the demographic data, diagnosis, duration of hospital stay, type of drug, dosage regimen, average number of drugs per encounter, percentage of encounters with an antibiotic prescribed and group wise prescription of antibiotics. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Student t test was used for evaluation of level of significance.

## RESULTS

In the present study, total number of patient prescriptions analysed were 500. Total number of drugs prescribed was 2210. Average number of drugs per prescription was 4.42 while percentage of prescription with oral antibiotics was 96.15 percent. In the present study, Cephalosporin, Penicillin, Aminoglycosides and Macrolides were prescribed in 37.33 percent, 36.11 percent, 25.75 percent and 5.06 percent of the patients.

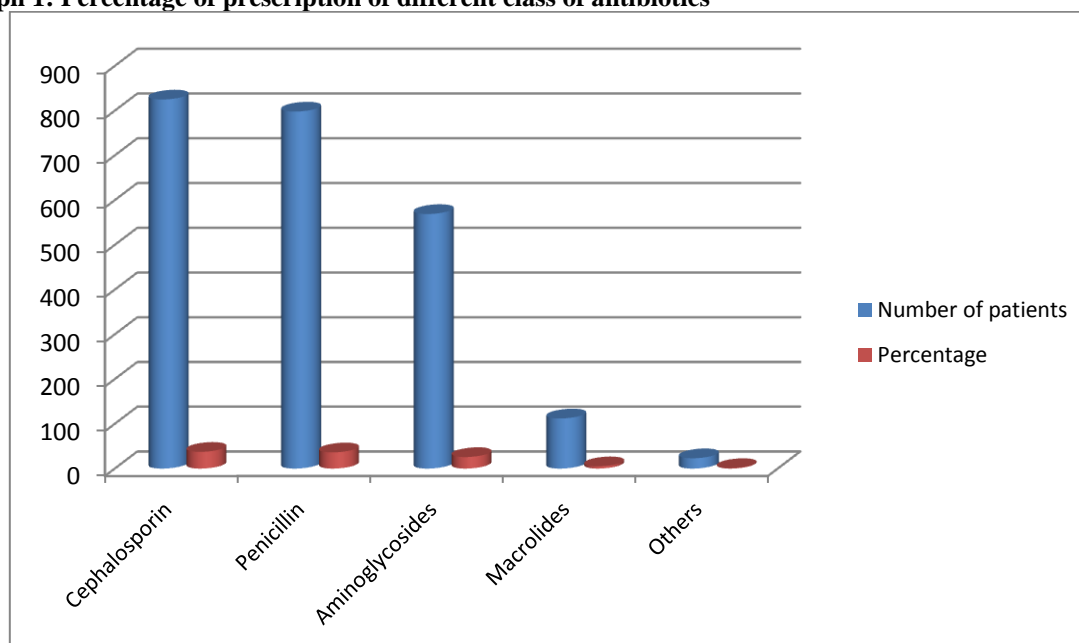
**Table 1: Prescribing pattern of drugs**

Variable	Number
Total number of patient prescriptions analysed	500
Total number of drugs prescribed	2210
Average number of drugs per prescription	4.42
Percentage of prescription with oral antibiotics	96.15

**Table 2: Percentage of prescription of different class of antibiotics**

Antibiotic	Number of patients	Percentage
Cephalosporin	825	37.33
Penicillin	798	36.11
Aminoglycosides	569	25.75
Macrolides	112	5.06
Others	23	1.04

**Graph 1: Percentage of prescription of different class of antibiotics**



## DISCUSSION

Respiratory tract infections (RTIs) in children are one of the most common reasons for parents consulting health professionals. Most RTIs are self-limiting viral illnesses that will resolve with time and supportive management. However, it is important for the health professional to identify any RTI that may have more serious implications for the child and require medical intervention. Diagnosis can usually be made from the history and presenting symptoms such as cough, wheeze, tachypnea, fever, or stridor. Exclusion of "red flag" symptoms will enable health professionals to appropriately reassure parents and advise symptomatic management with antipyretics and adequate fluid administration.<sup>5-7</sup>

Some children will require admission to hospital for respiratory support and other therapies, such as intravenous antibiotics and fluids. With advancement of the "non-medical prescriber" within the nursing profession, awareness of when to give or not give antibiotic therapy needs careful consideration, especially in light of the problems that may arise from overuse of antibiotic treatment.<sup>8-10</sup> Hence; under the light of above mentioned data, the present study was undertaken for evaluating the antibiotic prescribing pattern in lower respiratory tract infection among pediatric subjects of less than 5 years of age.

In the present study, total number of patient prescriptions analysed were 500. Total number of drugs prescribed was 2210. Average number of drugs per prescription was 4.42 while percentage of prescription with oral antibiotics was 96.15 percent. Hemamalini MB et al evaluated the pattern of antibiotic use among children under 5yrs of age. The demographic data, diagnosis, type of drug, dosage duration of treatment and hospital stay was collected from inpatients admitted to pediatric ward over a period of 6 months. A total of 250 in patient case records of children with LRTI were analyzed. In this study less than 1 year children constituted highest percentage (59.2%). 56.8% were males and 43.2% were females. A total of 1045 drugs were prescribed in 250 prescriptions (4.18 drugs/ prescription). Bronchiolitis (41.6%) was the most common diagnosis followed by Bronchopneumonia (33.6%). 32.77% of patients receive one antibiotic, 39.49% received 2 antibiotics and 27.73% of patients received 3 antibiotics. Most commonly prescribed antibiotic was Amoxicillin+clavulanic acid (58%), followed by Amikacin (57%) and Ceftriaxone (53%). It is evident from the present study that antibiotics were most commonly prescribed for LRTI.<sup>10</sup>

In the present study, Cephalosporin, Penicillin, Aminoglycosides and Macrolides were prescribed in 37.33 percent, 36.11 percent, 25.75 percent and 5.06 percent of the patients. Aabenhus R et al aimed to characterise the pattern of antibiotic prescriptions for patients diagnosed with acute respiratory tract infections, by means of electronic prescriptions, labeled with clinical indications, from general

practice. Acute respiratory tract infections accounted for 456,532 antibiotic prescriptions issued. Pneumonia was the most common indication with 178,354 prescriptions (39%), followed by acute tonsillitis (21%) and acute otitis media (19%). In total, penicillin V accounted for 58% of all prescriptions, followed by macrolides (18%) and amoxicillin (15%). The use of second-line agents increased with age for all indications, and comprised more than 40% of the prescriptions in patients aged >75 years. Women were more often prescribed antibiotics regardless of clinical indication. This is the first Danish study to characterise antibiotic prescription patterns for acute respiratory tract infections by data linkage of clinical indications. The findings confirm that penicillin V is the most commonly prescribed antibiotic agent for treatment of patients with an acute respiratory tract infection in Danish general practice. However, second-line agents like macrolides and amoxicillin with or without clavulanic acid are overused.<sup>11</sup>

## CONCLUSION

From the above results, the authors conclude that physicians and Doctors should be more aware on more appropriate and cost effective prescribing.

## REFERENCES

1. Van Woensel JBM, van Aalderen WMC, de Weerd W, Jansen NJG, van Gestel JPJ, Markhorst DG, et al. The efficacy of dexamethasone in the treatment of patients mechanically ventilated for lower respiratory tract infection caused by respiratory syncytial virus: a randomized controlled trial. *Thorax* 2003;58: 383-7.
2. Madhi SA, Schoub B, Simmank K, Blackburn N, Klugman KP. Increased burden of respiratory viral associated severe lower respiratory tract infections in children infected with human immunodeficiency virus type-1. *J Pediatr* 2000;137: 78-84.
3. Graham SM, Gibb DM. HIV disease and respiratory infection in children. *Br Med Bull* 2002;61: 133-50.
4. Kimpen JLL, Schaad UB. Treatment of respiratory syncytial virus bronchiolitis: 1995 poll of members of the European Society for Paediatric Infectious Diseases. *Pediatr Infect Dis J* 1997;16: 479-81.
5. Tupasi T. E., Lucero M. G., Magdangal D. M., Mangubat N. V., Sunico M. E., Torres C. U. et al. Etiology of Acute Lower Respiratory Tract Infection in Children from Alabang, Metro Manila. *Reviews of Infectious Diseases*. 1990;12(Suppl. 8):S929-39.
6. Neuzil K. M., Zhu Y., Griffin M. R., Edwards K. M., Thompson J. M., Tollefson S. J., Wright P. F. Burden of Interpandemic Influenza in Children Younger Than 5 Years: A 25-Year Prospective Study. *Journal of Infectious Diseases*. 2002;185:147-52.
7. Nolan T., Angos P., Cunha A. J., Muhe L., Qazi S., Simoes E. A. et al. Quality of Hospital Care for Seriously Ill Children in Less-Developed Countries. *Lancet*. 2001;357(9250):106-10.
8. Usen S., Weber M., Mulholland K., Jaffar S., Oparaugo A., Omosigbo C. et al. Clinical Predictors of Hypoxaemia in Gambian Children with Acute Lower Respiratory Tract Infection: Prospective Cohort Study. *British Medical Journal*. 1999;318(7176):86-91.

9. Van den Hoogen B. G., de Jong J. C., Groen J., Kuiken T., de Groot R., Fouchier R. A., Osterhaus A. D. A Newly Discovered Human Pneumovirus Isolated from Young Children with Respiratory Tract Disease. *Nature Medicine*. 2001;7:719–24.
10. Hemamalini MB et al. Prescribing pattern of antibiotics in lower respiratory tract infection among children aged less than 5 years. *Indian Journal of Pharmacy and Pharmacology*, October-December 2016;3(4);182-185
11. Aabenhus R, Hansen MP, Saust LT, Bjerrum L. Characterisation of antibiotic prescriptions for acute respiratory tract infections in Danish general practice: a retrospective registry based cohort study. *NPJ Prim Care Respir Med*. 2017;27(1):37. Published 2017 May 19. doi:10.1038/s41533-017-0037-7