

A Hospital Based Cross Sectional Study Assessing APR in Pediatric URTI Patients with Respect to Available Benchmark and to Decide on Interventions Required to Improve the Prescription Behavior

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Abstract

Aim: The current study was conducted to assess the APR in pediatric outpatient department (OPD) for URTI patients with respect to available benchmark and to decide on interventions required to improve the prescription behavior.

Material & Methods: This was a cross sectional observational study at conducted in Department of Pharmacology in collaboration with Department of Pediatrics over a period of 10 months, at DMCH, Darbhanga, Bihar. The prescriptions of children diagnosed with upper respiratory tract infections and lower respiratory tract infections (LRTI) were screened. Their demographic profile and details of drugs prescribed were recorded. Total 100 patients were included in the study.

Results: Out of 100 patients, boys were 40 and girls were 60. Age group 5-7 years had 15, 7-9 years had 20, 9-11 years had 35 and 11- 13 years had 30 children. Antibiotics prescribed in children were co-amoxiclav in 34, amoxycillin in 30, Ofloxacin in 20 and cefuroxime in 16. The difference was significant ($P > 0.05$).

Conclusion: URTI was treated using single antimicrobial whereas LRTI was treated with more than one antimicrobials or combination of antimicrobial and antiviral agent. The prescriptions were in accordance with the national treatment guidelines.

Keywords: Antibiotics, Children, Upper Respiratory Tract Infection.

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Introduction

Acute respiratory tract infection (ARTI) is the most common reason for antibiotic prescription in children and adults. Antimicrobial agents are often prescribed in the pediatric population for treating various infections. The accurate determination of safety and efficacy of any drug being prescribed to a child is rather different from adults as it is dependent on understanding pharmacokinetics and pharmacodynamics of a particular drug, as well as the clinical characteristics of the child being treated with that particular drug. [1] The benefits of antibiotics for the management of most cases of ARTI such as sore throat are marginal. Inappropriate prescribing of antibiotics for patients with mainly URTI is common. [2]

It is calculated that 75% of overall antibiotic prescribing takes place in primary care. Antibiotic use is associated with increased risk of isolation of

antibiotic-resistant organisms. Differences in antimicrobial drug use around the world reflects differences in local medication policies based on antimicrobial sensitivity, barriers to healthcare access, preferences of health-care providers and maternal attitude towards medication use. Prescribing antimicrobial agents not adhering to the treatment guidelines, inappropriate use of medicines such as overuse, underuse and misuse, and self-medication can inadvertently lead to development of antimicrobial resistance. [3] Prescription behavior of general practitioners and over-the-counter dispensing of medicines by pharmacists often mimic that of the specialists. Therefore, it becomes necessary that prime institutions lead the way in prescription behavior. [4]

A well-known method for reducing antibiotic

prescriptions for ARTI is the use of delayed prescriptions. [5] These are valid prescriptions issued at the time of the consultation. The PCP usually negotiates with the patient that they are not to be used immediately but only if the patient feels that their symptoms deteriorate or do not improve as expected. [6] There is evidence of irrational prescription of antibiotics in febrile children [7], especially with respiratory tract infections (RTIs). [8] In low and middle-income countries (LMICs), high levels of antimicrobial resistance correlate with the high number of antibiotics prescribed in children with fever. Globally, the prevalence of antibiotic prescription is 32%. [8] Children suffering from viral infections or non-infectious diseases receive antibiotics frequently. [9] Antibiotic stewardship programs for pediatric patients are implemented across developed and developing countries to curb the burgeoning antibiotic resistance crisis. [10,11]

The present study was conducted to assess antibiotic usage in upper respiratory tract infections in children.

Material & Methods

This was a cross sectional observational study conducted in Department of Pharmacology in collaboration with Department of Pediatrics over a period of 10 months, at DMCH, Darbhanga, Bihar. It was performed in accordance with the Declaration of Helsinki and institutional ethics committee approval was obtained before initiation of the study. Total 100 patients were included in the study. Written informed consent from the parent of each child who met the inclusion criteria

was taken after explaining the purpose of the study and before screening their prescriptions. Assent was obtained from the children between 12 to less than 18 years of age along with their parents' written informed consent.

Inclusion criteria:

Pediatric patients diagnosed with respiratory tract infection having age more than 2 and less than 18 years attending pediatric outpatient department (OPD) or admitted in pediatric ward or pediatric intensive care unit.

Exclusion Criteria

Children suffering from malaria, tuberculosis, HIV/AIDS or other immunodeficiency diseases, congenital heart diseases, and cancer, necessitating long-term antibiotic treatment or prophylaxis, were excluded.

The demographic details of each selected pediatric patient, diagnosis, and details of drugs prescribed such as, name of the drug, generic or brand name, its strength/dose, route of administration, frequency of use, average number of drugs per prescription, number of fixed dose combinations (FDCs), and duration of treatment were recorded in the case record form.

Statistical analysis

The data was analyzed with the help of statistical software SPSS, version 22 for windows. Descriptive statistic was used and the collected data was expressed in terms of numbers and percentages

Results

Table 1: Demographic details

Gender	Number	%
Boys	40	40
Girls	60	60
Age group (years)		
5-7	15	15
7-9	20	20
9-11	35	35
11-13	30	30

Out of 100 patients, boys were 40 and girls were 60. Age group 5-7 years had 15, 7-9 years had 20, 9-11 years had 35 and 11- 13 years had 30 children.

Table 2: Type of antibiotic used

Antibiotic used	Number	P value
Co-amoxiclav	34	0.10
Amoxycillin	30	
Ofloxacin	20	
Cefuroxime	16	

Antibiotics prescribed in children were co-amoxiclav in 34, amoxycillin in 30, ofloxacin in 20 and cefuroxime in 16. The difference was significant ($P > 0.05$).

Discussion

Acute respiratory tract infection (ARTI) is the most common reason for antibiotic prescription in children and adults. The benefit of antibiotics for the management of most cases of ARTI such as

sore throat is marginal. Inappropriate prescribing of antibiotics for patients with mainly URTI is common. [2] It is calculated that 75% of overall antibiotic prescribing takes place in primary care. Many medical practitioners do not think that antibiotic prescription in children is responsible for the development of antibiotic resistance where acute cough can last from 9 to 18 days while public expectation is for a duration of 7–9 days. [12] Antibiotic use is associated with increased risk of isolation of antibiotic-resistant organisms. Prescription behavior of general practitioners and over-the-counter dispensing of medicines by pharmacists often mimic that of the specialists. Therefore, it becomes necessary that prime institutions lead the way in prescription behaviour. [13] Antibiotic use is associated with increased risk of isolation of antibiotic-resistant organisms. [14] Prescription behaviour of general practitioners and over-the-counter dispensing of medicines by pharmacists often mimic that of the specialists. [15] Therefore, it becomes necessary that prime institutions lead the way in prescription behavior.

Out of 100 patients, boys were 40 and girls were 60. Age group 5-7 years had 15, 7-9 years had 20, 9-11 years had 35 and 11-13 years had 30 children. Antibiotics prescribed in children were co-amoxiclav in 34, amoxicillin in 30, ofloxacin in 20 and cefuroxime in 16. The difference was significant ($P > 0.05$). Connor et al [16] reviewed the published literature pertaining to antibiotic prescribing in order to identify and understand the factors that affect primary care providers' prescribing decisions. Primary care providers are highly influenced to prescribe by patient expectation for antibiotics, clinical uncertainty and workload induced time pressures. Strategies proven to reduce such inappropriate prescribing include appropriately aimed multifaceted educational interventions for primary care providers, mass media educational campaigns aimed at healthcare professionals and the public, use of good communication skills in the consultation, use of delayed prescriptions especially when accompanied by written information, point of care testing and, probably, longer less pressurised consultations. Delayed prescriptions also facilitate focused personalised patient education.

In a point-prevalence study, TMP-SMZ was the most prescribed antibiotic in Japan. [17] In another study in India, aminoglycosides and third-generation cephalosporins were most used for respiratory infections and acute febrile illnesses. [18] The evidence confirms that antimicrobial stewardship needs to be followed appropriately in the OPD setting. In this study, the most common reason for antibiotic prescription was presumed enteric fever (in 45 out of 46 children (97.8%)). Due to the emergence of extremely drug-resistant

(XDR) typhoid, with sensitivity to only azithromycin and meropenem, there is a shift in antibiotic prescription trends. [19] The DESCARTE study has been looking at the symptomatic outcome of acute sore throat in a random sample of 2876 adults according to antibiotic prescription strategy in routine care. It concludes that in the routine care of adults with sore throat, a delayed antibiotic strategy confers similar symptomatic benefits to immediate antibiotics. [20]

Conclusion

The most commonly antibiotic prescribed in children were co-amoxiclav, amoxicillin, ofloxacin and cefuroxime. URTI was treated using single antimicrobial whereas LRTI was treated with more than one antimicrobials or combination of antimicrobial and antiviral agent. The prescriptions were in accordance with the national treatment guidelines.

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