



Research Article

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A study on use of antimicrobials in pediatric ward of a large hospital

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Abstract

Objective: Different surveys have shown that use of antimicrobials is common in practice in urban population. The use of antimicrobials in pediatrics is increasing which is a matter of great concern, A study performed in Emilia Romagna, showed, from 511270 antimicrobial prescriptions 219257 children were identified. That is associated with growing hazard of antimicrobial resistance in pediatric patients. Therefore, a study is performed to evaluate the use of antimicrobial in children to determine the inappropriateness associated with the use of the bulk prescribing in peds. **Method:** A Prospective observational study is being carried out in the pediatric ward of a tertiary care hospital from June 5th to December 5th. All patients admitted to pediatric ward during study period are considered as study population excluding patients with incomplete data. All the relevant details of patients were collected through a specially designed performa including demographic, disease, and drug data, than analyzed. **Results:** In the study period a total of 378 children admitted in the pediatric ward, 200 children were included for the analysis. The mean for age was 3.60 ± 3.25 years. The Penicillins 18%, Cephalosporin 65% and Aminoglycosides 13% Chloramphenicol 4% were the commonly prescribed antimicrobials. 29 prescriptions targeted the appropriateness of Penicillins (appropriateness range, 14.5% to 18%), 90 prescription for Cephalosporin targeted appropriateness (45% to 65%) 26 for Aminoglycosides targeted appropriateness (9% to 13%) & 6 for Chloramphenicol targeted appropriateness (0.02% to 4%). **Conclusion:** Overall, a wide spectrum of clinical disorders, extensive poly-pharmacy and inappropriate prescribing of antimicrobials was noticed.

Keywords: Antimicrobials, Pediatric, Inappropriate.

INTRODUCTION

Antimicrobials are used not only to eradicate but also to prevent any infectious disease. Unfortunately, sometimes these agents are used inappropriately. Although Physicians are slowly improving their antibioticprescribing patterns but the use of inappropriate antibiotics is still common. Almost half of patients with upper respiratorytract infections receive antibiotic ^[1]. In pediatrics, the continuously increase use of antibiotics contributes to the emergence of antibiotic resistance. A study showed, from 511270 antimicrobial prescriptions 219257 children were identified ^[2]. In addition adverse drug reactions and increase cost of therapy are also contributed features. Along with that the inappropriate use of antibiotics also is a key reason of bacterial resistance. Antimicrobial resistance of Streptococcus pneumoniae and Haemophilus influenzae presents a challenge to clinical case management, particularly in programs for acute respiratory tract infection (ARI), including pneumonia, in developing countries ^[3]. The rising prevalence of penicillin-resistant pneumococci worldwide mandates selective susceptibility testing and epidemiological investigations during outbreaks ^[4]. It has therefore become very important to monitor and evaluate the prescribing patterns of antibiotics in children. Therefore we performed a prospective study to evaluate and analyze the reasons for increased and inappropriate antibiotic use in pediatrics.

MATERIALS AND METHODS

This prospective observational study was carried out from June 5th to December 5th at Abbasi Shaheed Hospital. Formal approval for the study was taken from the Ethical Committee. The study population included all the patients of both genders admitted in the pediatric ward during the study period with ages ranging from to patients with incomplete data as well as patients who were not prescribed antibiotics and those who were discharged within 24 hours of admission were excluded from the study. Prior to start the

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study permission was taken from the Head of the Pediatric Ward to collect data and accompanying information. All the prescriptions were reviewed and required data was collected using a specially designed Performa that had all the relevant details. The data included the demographic details (age, sex, weight of the patient), clinical data (clinical diagnosis, co morbid conditions) and drug data (drugs prescribed, brand name, dosage, route and frequency of administration). The collected data was then finally reviewed and analyzed to evaluate drug prescribing patterns.

RESULTS AND DISCUSSION

During study period the total number of pediatric patients admitted to the ward was 378 of which 200 were included in the study while the rest excluded exclusion criteria is based on incomplete data, patient being discharged within 24 hours of admission. Out of 200 patients 44% (n=88) were males and 56% (n =112) were females. The Cephalosporin 65%, Penicillins 18%, and Aminoglycosides 13% Chloramphanicol 4% were the commonly prescribed antimicrobials. (Figure 1) Cephalosporins are among the mostly prescribed antibiotic in children of all the cephalosporins have certain advantages that have made them a popular choice among physicians in the world. These include a broad range of antimicrobial activity, concentration-independent bactericidal activity, and excellent tolerance in children, with almost no dose-related toxicity. These drugs also can be used safely in most infants and children with hepatic or renal failure. Serious adverse reactions are rare and consist primarily of hypersensitivity with urticaria, nonspecific rash and pruritis. Cephalosporins are useful agents because of their spectrum of activity against many pediatric pathogens and their excellent safety record [5, 6].

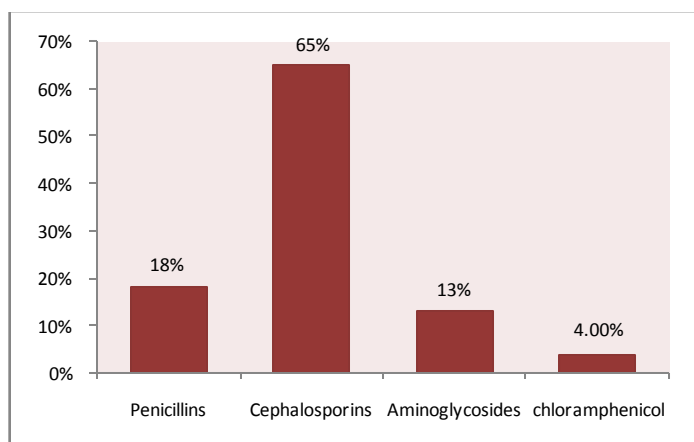


Figure 1: Commonly Prescribed Antimicrobials

Common clinical diagnosis for which antimicrobials were prescribed included Gastritis 35%, Pharyngitis 42.5%, Meningitis 8.5%, pneumonia 9.6%. (Figure 2) The worldwide prevalence of gastritis reflects the prevalence of *H. pylori*. Colonization with this bacterium is virtually always associated with chronic active gastritis, which persists as long as an individual remains colonized and only slowly disappears 6 to 24 months after the eradication of *H. pylori*. In developing countries and among first-generation immigrants from these countries, the prevalence of *H. pylori* gastritis is high (often $\geq 80\%$) in all age groups, including children [7].

Most common co morbidity found includes Malaria 34.44%, Epilepsy 16.6%, Jaundice 13%, allergies 10% and others 27%. Hundred percent of the antibiotics were prescribed without culture sensitivity test. 29 prescriptions targeted the appropriateness of Cephalosporin targeted appropriateness (45% to 65%), Penicillins (appropriateness range,

14.5% to 18%), 90 prescription for 26 for Aminoglycosides targeted appropriateness (9% to 13%) & 6 for Chloramphanicol targeted appropriateness (0.02% to 4%).

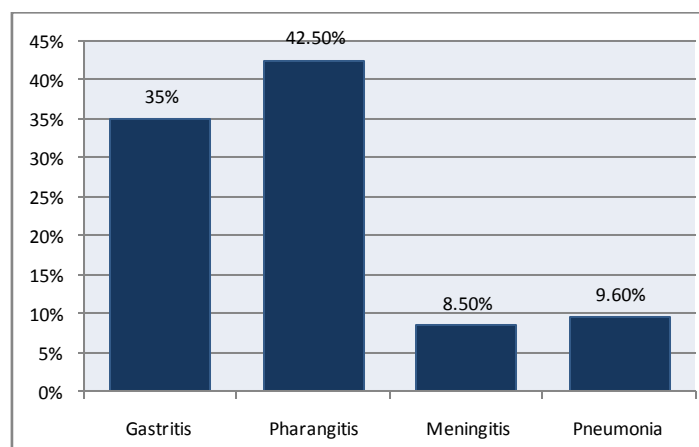


Figure 2: Common indications found for Antimicrobials

This study showed the prescribing pattern of antibiotic in pediatrics which contributes to the emergence of antimicrobial resistant strains. The most predominant infective condition was found to be gastritis. The high prevalence of resistance to commonly used antibiotics in pediatrics has caused considerable alarm. Irrational prescribing of antibiotics has become a common practice in developing countries. Worldwide, more than 50% of all medicines are prescribed, dispensed or sold inappropriately, and 50% of patients fail to take them correctly [8]. The reasons of inappropriateness are listed in table # 1 of which the rate of use of antibiotics in non bacterial syndrome is higher. Physicians commonly prescribe antibiotics without proper culture sensitivity test and in non infective conditions on the basis of their routine practice in order to rapidify the treatment duration. Thus, use of antibiotics without proper culturing, administering antibiotics at inappropriate dose and frequency and for incomplete prescribed duration may be the key reason for emergence of bacterial resistance [9].

Table 1: Reasons of inappropriate antimicrobial therapy

Inappropriate Regimen (n=124)	
Reasons of Inappropriateness	Number of Prescription
Non bacterial syndrome	40
Redundant antimicrobial coverage	10
Coverage broader than necessary	35
Longer duration of treatment than necessary	15
Treatment not discontinued when no evidence of infection	5
Drug interaction	4
Wrong dosing	15

CONCLUSION

A variety of unnecessary drugs were utilized from various drug classes. Poly pharmacy and the mean number of drug prescribed per patient were high in pediatric ward. In many cases the use of antibiotics was inappropriate because there was no indication for antimicrobial therapy. Antibiotics are sensitive drugs and their prescribing and dispensing

should be properly regulated in order to optimize efficacy and minimize adverse outcomes.

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