Drug prescription pattern in paediatric out patient clinic in a tertiary hospital

Author(s): Janaki R. Torvi and Suman Dambal

Vol. 15, No. 2 (2011-07 - 2011-12)

Janaki R. Torvi* and Suman Dambal(2)

Department of Pharmacology, Karnataka Institute of Medical Sciences (KIMS), Hubli-21, Karnataka, India.

Abstract

A prescription by a doctor may be taken as a reflection of physician's attitude to the disease and the role of drug in its treatment. Feedback from the study would help both the pre-scriber and institutional authorities to review their prescribing practices and modify if nec-essary to facilitate better health care delivery. To evaluate the prescription patterns and to generate data on rational/irrational prescribing in patients suffering from upper respiratory tract infections attending paediatric OPD at a tertiary hospital. A prospective cross sectional study was conducted and the prescription data of patients with upper respiratory tract in-fection were collected for a period of three months. A total of 667 drugs were prescribed to 300 patients suffering from upper respiratory tract infection. Drug classes with largest rep-resentation were the antibiotics (37%). Penicillins represented the largest antibiotic drug class (76%). The most commonly used group of drugs were antibiotics out of which penicil-lins were largely prescribed. From the data it is understood that the administration of anti-biotics was inappropriate as the duration of treatment was insufficient (3 days). Over pre-scription of antibiotic for insufficient duration may increase the risk of resistance.

Key words: URTI, Prescription patterns, Antibiotics resistance
Accepted April14 2011

Introduction

A prescription by a doctor may be taken as a reflection of physician's attitude to the disease and the role of drug in its treatment. It also provides an insight into the nature of health care delivery system. Prescription writing is a sci-ence and an art, as it conveys the message from the pre-scriber to the patient. Infants and children are among the most vulnerable population groups to contract illnesses. The use of antimicrobial agents, especially antibiotics has become a routine practice for the treatment of paediatric illnesses[1,2]. However, there are also reports of an irra-tional use of antibiotics [3,4] which may even lead to in-fections that are worse than the originally diagnosed ones. Irrational prescription of drugs is a common occurrence in clinical practice [5] In the medicine practice, there is a growing concern regarding the irrational prescription pat-tern and use of antibiotics.

The assessment of drug utilisation is important for clini-cal, educational and economic reasons[6].Various factors influence the prescribing behaviour of clinicians and to change the behaviour it is necessary to understand the reasons behind it[7]. It is necessary to define the prescrib-ing pattern and to target the irrational prescribing habits for sending a remedial message[8]. Drug Utilisation Re-views (DURs) are useful for obtaining information about drug usage patterns and for identifying high cost drugs, which are of economic interest[9]. Data about drug usage patterns in India are particularly lacking. Keeping these facts in consideration the present study has been planned to define the pattern of antibiotic use in the paediatric out-patient department at a tertiary care hospital in Hubli, Karnataka.India. The treatment of diseases by the use of essential drugs, prescribed by their generic names, has been emphasized by WHO and National health policy of India [10]. Upper respiratory tract infection is the most common morbidity in paediatric age group. It is a loose term which includes infections of nasal cavity, throat, nasopharynx, ears and sinuses[11]. Most common organ-isms causing upper respiratory tract infections are S. pneumonia (30%), H. influenza (20%) and M. catarrhalis (12%) [12]. The present study was undertaken to evaluate the drug prescription patterns in patients suffering from upper respiratory tract infections attending the paediatric out patient department and to generate data on the extent of rational/irrational prescribing in this institute. Feedback from the study would help both the prescriber and institu-tional authorities to review their prescribing practices and modify if necessary to facilitate better health care deliv-ery.

Materials and Methods

A prospective cross-sectional study of three months dura-tion was undertaken from March 2009 to May 2009. The study was conducted in the paediatric out patient depart-ment and 300 prescriptions given to the patients suffering from upper respiratory tract infection were collected. Ba-sic drug indicators were selected to analyze the prescrib-ing patterns[13]. Patient (name, age, out patient number) and drug data (average number of drugs /prescription, percentage of drugs prescribed by generic name and per-centage of prescriptions with an antibiotic prescribed) were recorded. Permission to conduct the study was taken from the Head of the department of Paediatrics. Prescrib-ing frequency was expressed as a percentage of the pre-scription of the individual drug/drug class in a particular age/sex category to the total number of patients in the particular age/sex category. Further whether the drugs were prescribed using generic names or brand names was also studied.

Results

Out of 300 prescriptions, a total of 667 drugs were pre-scribed. The average number of drugs per prescription was 2.22. Percentage of drugs prescribed by generic name was 96%. Out of 667 drugs, the most frequently pre-scribed drug classes were antibiotics (37%), antipyretics (32%), antihistamines (28%), bronchodilators (2%) and H2 receptor blockers (1%)(Figure 1). Antibiotics were present in 247 (82%) of 300 prescriptions and constitute 37% of total number of drugs. Out of 247 antibiotics used, the most frequently used antibiotics were amoxicil-lin (72%), cephalexin (17%), cotrimoxazole (4%), eryth-romycin (2%) and ciprofloxacin (1%)(Figure The average duration of antibiotic prescription was 3 days. Most of the prescriptions contained the patient and drug information data – patient's name, age, out patient number, strength, dose, dosage form, frequency and duration of treat-ment.Most of the patients recovered after receiving the treatment with antibiotics.But some did not respond to antibiotics which could be because of the viral infection

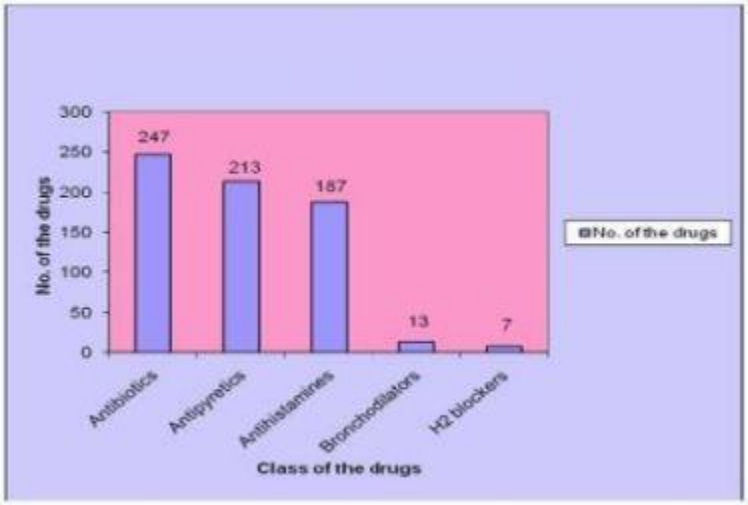

Figure 1: Five most commonly prescribed classes of drugs (n=667)

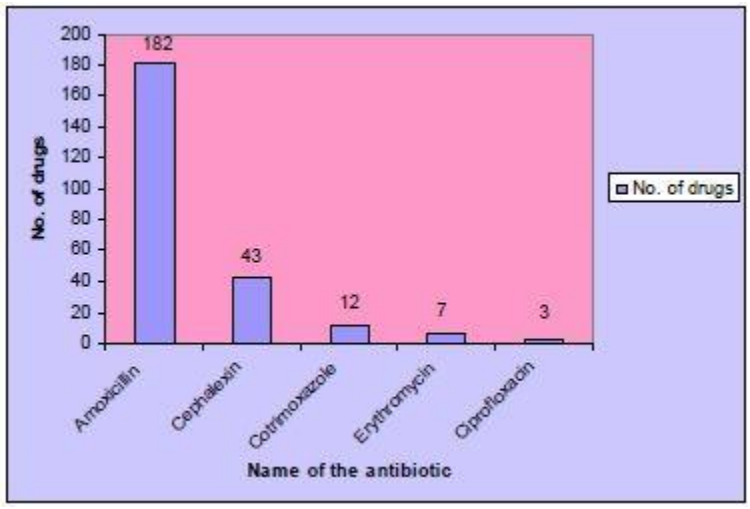

Figure 2. Five most commonly prescribed antibiotics (n=247)

Discussion

The most commonly used drug group was antibiotic. The prescribing prevalence of antibiotics was also high (82). The excessive use of antimicrobials is similar to the reports from other developing countries[14,15].In the de-veloping countries, bacterial infections account for much of the morbidity and mortality. This kind of statistic forms the most important index of ongoing antibiotic au-dit programs as it indicates the changes in the pattern of usage and in susceptibility patterns of bacteria that cause upper respiratory tract infection. As most of the popula-tion in developing countries exist under conditions of poverty, inadequate medical care, poor sanitation and nu-trition[16], bacterial infection account for much of the morbidity and mortality particularly in the paediatric age group[17,18]. Antimicrobial drug use rates are high-est for children[19]; therefore, the pediatric age group represents the focus for the present guide-lines. Antimicrobial resistance among respiratory pathogens has become a common clinical problem and its management a part of routine office practice. Currently, ~90 of Moraxella catarrhalis and 25% of nontypeable Haemophilus influenzae produce -lactamase[20],requiring treatment with -lactamase-stable cephalosporins or combination drugs that in-clude -lactamase inhibitors such as amoxicillin-clavulanate.The widespread use of antimicrobials, whether appropriate or inappropriate, has driven the emergence and spread of resistant organisms. The association of resistance with the use of antibiotics has been documented in both inpatient[21] and out-patient[22] settings. Children can be protected from resistant bacteria through the judicious use of antim-icrobial agents by their health care providers. The pattern of use observed was that amoxicillin was most commonly prescribed, which comes under penicillin group of drugs. Obviously, this is due to the limited choice of drugs available in the hospital. The most com-mon bacteria causing upper respiratory tract infection – Streptococcus pneumoniae – is sensitive to penicillin group of antibiotics[23] which justifies the prescription of amoxicillin to these patients. Amoxicillin being one of the older and most effective antibiotic in the treatment of up-per respiratory tract infection, it is advisable to preserve this antibiotic for future use by prescribing alternative effective antibiotics for an appropriate duration. It is noteworthy that ciprofloxacin was prescribed to only 1% of patients with upper respiratory tract infection because of its toxic effects in children. In this study, 96% of the prescriptions were by generic names of drugs which ac-cording to WHO and National Health Policy of India is appropriate. Average number of drugs per prescription (in a prescription audit) is an important index of the scope for review and educational interventions in prescribing prac-tices.

Conclusion

The appropriate use of antibiotics delays the development of drug resistance by micro organisms. As per the data, the use of antibiotics like amoxicillin, cephalexin and erythromycin in the treatment of upper respiratory tract infection is justifiable as the micro-organisms causing it are sensitive to the antibiotics. The most commonly used group of drugs were antibiotics out of which penicillins were largely prescribed.The patients are mostly from the rural areas. It is very inconvenient for them to get the refill of prescription and to come all the way from distant places. From the data it is understood that the administra-tion of antibiotics was inappropriate as the duration of treatment was insufficient (3 days),as most of the pa-tients required treatment for 5 days. Overprescription of antibiotic for

insufficient duration may increase the risk of resistance. Significant overlap exists in the clinical manifestations of bacterial and viral infection,which can lead to irrational prescribing of antibiotics for viral respi-ratory infections. From this study, feedback information can be provided to the prescribers and authorities of the institute to improve the prescription patterns and also to evaluate clinical picture appropriately so as to avoid anti-biotic prescription for viral cases and enable the patients to get the prescription for the required period The results indicate considerable scope for improving the prescribing pattern of drugs in the Paediatric OPD. The improvement would be facilitated by providing feedback, prescriber education and creation of a hospital formulary. The study provides baseline data for carrying out further therapeutic audit with more parameters of analysis which in turn will provide regular feedback to researchers and prescribers.

References

1. Sanz EJ, Bergman U. Dahlstorm M. Paediatric drug prescribing. Eur J clin pharmacol 1989; 37 (1): 65-68.
2. Summers RS, Summers B. Drug prescribing in paediat-rics. Ann Trop paediatr 1986; 6: 129-133.
3. Principi N, et al. Control of antibiotic therapy in paedi-atric patients. Developmental pharmacology and thera-peutics 1981; 2(3): 145-155.
4. Schollenberg E, Albritton WL. Antibiotic misuse in a paediatric teaching hospital. Can Med Assoc J 1980: 122 (1): 49-52
5. Ramsay LE. Bridging the gap between clinical pharma-cology and rational drug prescribing. Br J Clin Phar-macol 1993; 35: 575-576.
6. Uppal R, Nayak P, Sharma PL. Prescribing trends in internal medicine. Int J Clin Pharm Ther Toxicol 1984; 22: 373-376.
7. Soumerai SB. Factors influencing prescribing. Aust J Hosp Pharm 1988 (Suppl); 18: 9-16.
8. Mashford ML. Update-Victorian Medical Postgraduate Foundation Group. Aust J Hosp Pharm 1988 (Suppl); 18:17-18.
9. Marshner JP, Thurmann P, Harder S, et al. Drug utilisa-tion review on a surgical intensive care unit. Int J Clin Pharmacol Ther 1994;32:447-451.
10. Kishore J. National Health Programs of India. 6th edi-tion. New Delhi: Century Publications; : 2006:370
11. Kabra SK. Upper respiratory Tract Infections. IAP Textbook of Paediatrics. 2nd edition. Jaypee brothers medical publishers,:2002:387-389
12. Dhingra PL. Diseases of Ear, Nose and Throat: 4th edi-tion; Elsevier: 2007: 61-65.
13. Folke S, Donald B. Drug utilization. WHO booklet “Introduction to drug utilization research” 2003: 76-84.
14. Victor CG, Facchini LA, Filho MG. Drug use in Brazil-ian hospitals. Trop Doct 1982;12:231-235.
15. Kuruvilla A, George K, Rajaratnam A, et al. Prescrip-tion patterns and cost analysis of drugs in a base hospi-tal in south India. Natl Med J India 1994; 7(4):167-168.
16. Walsh JA, Warren KS. Selective primary health care: An interim strategy for disease control in developing countries. N Eng J Med 1979; 301: 967-974.
17. Grant J P. The state of the world’s children 1984. Ox-ford: United Nations Children Fund and Oxford Uni-versity Press (1984).
18. Riley L, Carad E, Graltn H. The status of research on acute respiratory infection in children in Papua New Guinea. Paediatric Research: 1983; 17: 1041-1043.
19. McCaig LF, Hughes JM. Trends in antimicrobial drug prescribing among office-based physicians in the United States. JAMA. 995; 273:214-219.
20. Barnett ED, Klein JO. The problem of resistant bacteria for the management of acute otitis media. Pediatr Clin NorthAm. 1995; 42:509-517 [Medline]
21. McGowan JE Jr Antimicrobial resistance in hospital organisms and its relation to antibiotic use. Rev Infect Dis. 1983; 5:1033-1048 [Medline]
22. Reichler MR, Allphin AA, Breiman RF. The spread of multiply resistant Streptococcus pneumoniae at a day care center in Ohio. J Infect Dis. 1992; 166:1346-1353
23. Jawetz, Melnick & Adelberg’s Medical Microbiology. 24th edition, Mc Graw-hill companies. 2007: 243-248.

Correspondence to:
Janaki R. Torvi
Department of Pharmacology
Karnataka Institute of Medical Sciences (KIMS)
Hubli-21, Karnataka, India.