

A Study of the Paediatric Prescriptions at the Tertiary Care Hospital in Oman

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Introduction

A drug is a chemical substance that is intended to be used in the treatment, cure, prevention, or diagnosis of disease or used to otherwise enhance physical or mental well-being. The use of drugs by humans is as old as the history of humanity itself. Antibiotics are widely used nowadays. An antibiotic can be defined as a substance that destroys or inhibits the growth of other microorganism and is used in the treatment of external or internal infections. The major types of antibiotics that are commonly used include beta lactams, cephalosporins, aminoglycosides, macrolides, carbapenems, quinolones, tetracyclines and polymyxins.

Drug prescribing is a vital practice in healthcare system. It should be safe and effective mode of treatment. The drug prescribing practice by physicians is influenced by many factors and one of the most important factors is the input information from the patient. Bad prescribing patterns lead to ineffective and unsafe treatment, exacerbations or prolongation of illness, distress and harm to patients and higher costs.

Analyzing prescribing patterns is a part of the medical audit and seeks to monitor, evaluate and suggest modifications in practioners prescribing habits so as to make medical care effective, safe and cost effective.

Drugs are prescribed to people of all age groups like pediatric, adult and geriatric. Pediatrics like infants and children are more prone to the harmful effects of drugs due to difference in pharmacodynamics and pharmacokinetic parameters compared to adults. Many studies showed that many children have developed resistance to antibiotics.

Pandey AA, et al. conducted a study on pediatric outpatients in Nagpur city. The study used four community pharmacies to analyze 1376 pediatric outpatient prescriptions from September to October 2008. Results showed that the total number of drugs prescribed by 41 doctors was 3435. The average drug per encounter was 2.5 and ranged from 1 to 7. About 97.7% prescriptions (1087) had at least two or more drugs prescribed [1].

Shinde R, et al. conducted a cross sectional study on prescription analysis of drugs prescribed for children by teaching hospital doctors and private doctors in Maharashtra, India. The survey used a semi-structured questionnaire to collect the data. The result of the study revealed that 431 drugs were prescribed from the teaching hospital and 379 drugs from private hospital. The study results showed that 2.11 and 2.22 was the average number of drugs per prescription in teaching hospital and private hospital respectively. The survey observed that syrup was the most commonly prescribed dosage form in both teaching hospital and private hospital (54.06% and 51.19% respectively). The study observed that antimicrobial drugs were the most commonly prescribed class of drugs and about 37.81% and 37.99% of them were prescribed in both teaching hospital and private hospital respectively. The study also revealed that antimicrobials were prescribed for conditions like malaria, urinary tract infection and gastroenteritis in both hospitals. The study concluded that antimicrobials, vitamins and minerals and cough /cold preparations were commonly prescribed for children, but rational prescribing practices of drugs were observed more with teaching hospital and antimicrobials were commonly prescribed for respiratory tract ailments. The study recommended necessary interventions to rectify over prescribing of antimicrobials and cough/cold FDCS. The study also recommended organizing regular workshop/ educational campaign for rational prescribing to address the issue [2].

Al Balushi KA, et al. conducted a retrospective cross section study on drug utilization pattern in pediatric population in SQUH. The study used prescriptions over a period of three months from March to April, 2012. The study found that the average number of drugs per encounter were 2.3 and 15.9% of drugs prescribed were antibiotics. Paracetamol (13%) was the commonly prescribed individual drug. The study concluded that the result would help in managing the rational usage of medicines among pediatric patients and optimizing the cost of medicines [3].

Al-Shami AM et al. conducted a cross-sectional study to evaluate the quality of antibiotic prescriptions in four health care facilities

of Sana 'a's (Al-Towrah, Al-Gomhory, Al-Kuwite and Al-Sabaeen) government hospitals in Yemen. The study analyzed 1200 prescriptions collected in the middle of the clinic day and observed that the total number of antibiotics prescribed under brand name were 76.8%. Out of all surveyed prescriptions, 51.0% of the prescriptions contained antibiotics. The study observed that they were lacking in many areas of important information like the diagnosis, patient's name, gender and age as well as prescribing information of the antibiotics (strength, dosage form, dose, frequency and duration). The study cited several potential problems in antibiotic usage in the government quaternary hospitals in Yemen and concluded that quality of prescriptions in the study location was poor and recommended the need for further research on a large scale in Yemen to improve the quality of prescribing [4].

Alam K. et al. conducted a study on prescribing pattern among pediatric inpatients in western Nepal over a period of four months in 2004 from December to March. The study found that the total number of admitted patients were 356 in which 228 were males and 128 were females. The medium duration of hospitalization was four days. The total number of drugs used were 1614. The study concluded that usage of antibiotics was high among admitted patients and geriatric prescribing was low. The study recommended formulation treatment guidelines for common conditions [5].

Bashrahil K.A conducted a cross sectional survey prepared in 20 health facilities of Hadramout city in Yemen from December to February 2003. The study examined 550 prescriptions from different level health facilities (11 hospitals, 4 health centers and 5 health units). The study results showed a total of 1527 drugs, the average number of drugs was 2.8 and ranged from 1 to 5. The maximum number of antibiotics prescribed in a prescription were 4 and antibiotics accounted for 28.8% of the total drugs prescribed. They recommended using generic name of drug in prescriptions, careful prescribing of antibiotics and injections. The study also recommended the supervision and monitoring by Ministry of public health about the drug use for improving prescribing practice [6].

Mahmood A et al. conducted a multicentric prospective cross sectional study in four government hospitals in United Arab Emirates during a period of 7 months. The study recommended creation of awareness among health personnel. The limitation of the study was that it did not cover all public hospitals and did not include private hospital where the outcome was expected to differ in all aspects of prescribing indicators [7].

Babalola C.P et al. conducted retrospective analysis on written prescriptions by various cadres in primary Healthcare department of Osun state (southwest), Nigeria. The study was done in four randomly selected Government areas with primary health care centers, dispensaries and health posts. The study analyzed 560 prescriptions and revealed that the percentage of antibiotic prescriptions for Ayedire, Isokan, Lwo and Osogbo were 41.2%, 49.38%, 49.62% and 59.34% respectively [8]. The study recommended the need to establish protocols on the prescription and administration for both antibiotics and injections because of their high consumption and to conduct regular continuing education programs.

Al Mahalli AA, and Akl OA, conducted a retrospective cohort study in two clinics at one primary health center in Alexandria, Egypt. The study analyzed a total of 300 prescriptions and the average

number of drugs per prescription was 1.37. The study observed that 15.3% prescriptions from clinic A contained antibiotics and 30% from clinic B [9]. The study recommended training physicians on prescribing of medicines.

Ahlawat R et al. conducted a study to assess the prescribing pattern in pediatric out-patient setting in north of India [10]. The study revealed that 1003(43.4%) prescriptions were for females and 1304 (56.6%) for males and the most common diagnosis was respiratory tract infections. The study results revealed 7735 different types of drugs and the average number of drugs per prescription was 3.40(+ or -0.41). The study showed that 1500 of the prescribed drugs were antibiotics. Cefexime and azithromycin were the most common antibiotics prescribed for 118 and 112 patients, respectively. The study concluded that the antibiotics were prescribed judiciously.

Ghosh R, et al., conducted a study on prescription trends in a teaching hospital of Bharatpur, Nepal. The study assessed a total of 204 prescriptions containing 886 drugs and observed that 72.05% of the prescriptions were for antibiotics [11].

Al-Niemat S et al. conducted a retrospective study on Antibiotic prescribing patterns in outpatient emergency clinics of Queen Rania Al Abdullah 11 children hospital, Jordan. Out of 3840 prescriptions 88% contained antibiotics. 1% contained one antibiotic, 11% contained two antibiotics [12]. The study observed that the average number of drugs per prescription were 2.4 and azithromycin (40%) and Co-Amoxiclav (25%) were the most commonly prescribed antibiotic groups. The study observed that the most common diagnosis was upper respiratory tract infection and azithromycin had the highest percentage share of prescribed antibiotics (53%) for treating URTI and the emergency physicians continued to frequently prescribe broad spectrum antibiotics which accounted for approximately 60%. The study concluded that prescribing of antibiotics by emergency department pediatricians was high. The study recommended necessary intervention by health care providers to promote rational and judicious prescribing among pediatricians.

Sharif SI et al. conducted a study on prescribing trends among pediatric outpatients in Governmental hospital of Umm Al Quwain, United Arab Emirates. The study analyzed 707 prescriptions and showed that most commonly prescribed therapeutic classes of drugs were antibiotics (44.60%), antihistamines (43.65%), and analgesics/ antipyretics (32.30%). The most commonly prescribed drugs among each class were amoxicillin (40%), zylometazolin (61.23%), and paracetamol (87.5%). The study recommended continuing medical education and healthcare professional development programs [13].

Aim and objectives of the study

The study was planned with the following objectives:

1. To identify patterns of drug use and prescribing in children
2. To identify drug classification use in children.
3. To identify antibiotics use in outpatient prescriptions in children.

Methodology

Study Area

The study was conducted in the tertiary care Hospital in Muscat, Sultanate of Oman.

Study Design

A retrospective survey was conducted in a outpatient pharmacy of a

tertiary care hospital in Oman. A total of 800 pediatric prescriptions were randomly selected over a period of three months from outpatient pharmacy and analyzed in the study. A data collection form was designed to record the prescribed medicine to children. The collected data was analyzed using excel software and descriptive analysis was performed and discussed.

Study Criteria

Inclusion criteria: All children in the age group between 1-year to 12-years.

Exclusion criteria: Children less than one year and more than 12 years.

Data Collection

The data was collected from the hard copies from the outpatient pharmacy in a tertiary care Hospital and was transferred to the data collection form.

Information regarding gender, age, names of drugs prescribed, classes of drugs prescribed, route of administration, names of antibiotics prescribed, classes of antibiotics prescribed and dosage form/s of drugs prescribed were recorded in the data collection form.

Permission to Conduct the Study

Permission was obtained to conduct the study from the Director of the tertiary care Hospital and Ethical committees of hospital and College.

Prescribing Indicators

Prescriptions were assessed for the pediatric drugs according to the treatment.

Results

Number of Drugs Prescribed Per Prescription

The study showed that among the 800 prescriptions analyzed, 58% (n=464) of them contained two drugs followed by one drug prescriptions (44.5 %; n=356) and three drugs containing prescriptions (39.5 %; n=316). About 1% (n=11) of prescriptions contained 11 drugs as shown in figure 1.

The average number of drug prescribed per prescription was =5

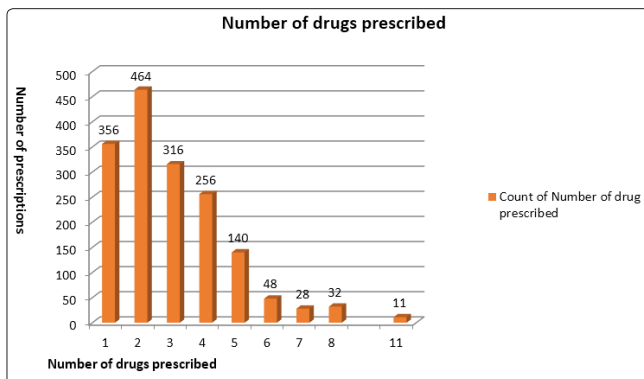


Figure 1: Number of Drugs Prescribed Per Prescription

Classes of Drugs Prescribed in Children

The results showed that among 800 prescriptions analyzed, the total number of the drugs were found to be 1652. 177 drugs were supplements amounting to 10.7 %, followed by corticosteroids (10 %) (n=163). About 18 classes of drugs prescribed were only 0.1

% (n=1). Examples include phosphodiesterase type 5 inhibitor, adrenergic agonist, alpha nonselective beta blocker, antiarrhythmic agent, antidiarrheal, antispastic, Antihyperthyroid. These are shown in figures 2 and 3.

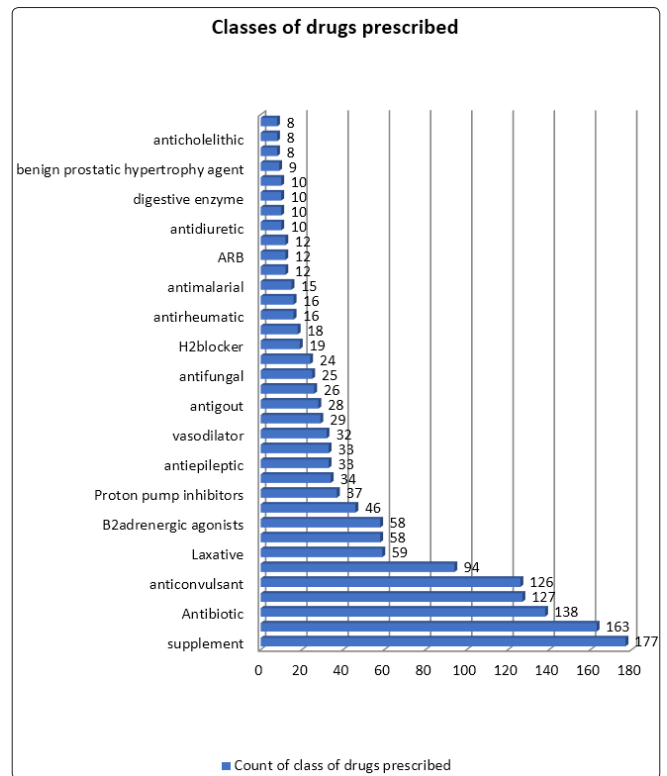


Figure 2: Classes of Drug Prescribed In Children

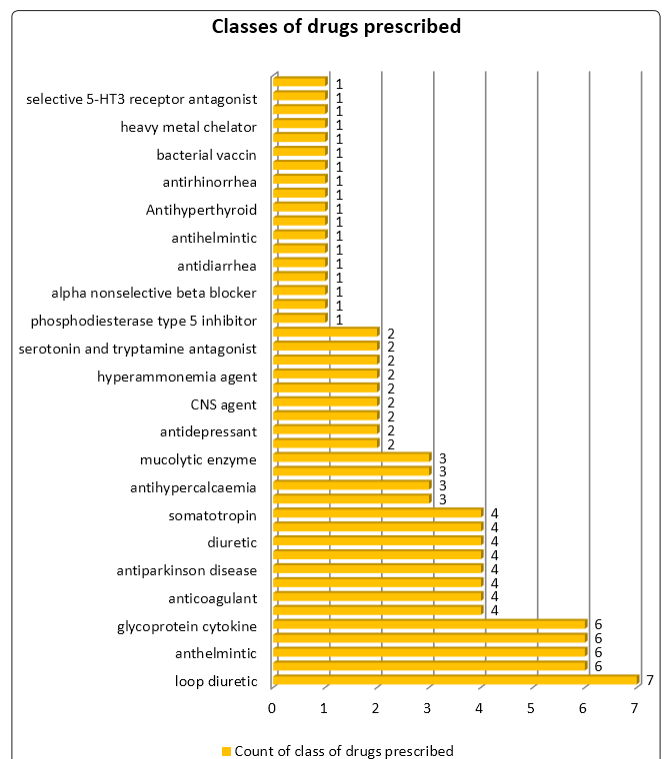


Figure 3: Classes of Drug Prescribed In Children

Antibiotics Prescribed in Children

The results showed that among a total of 800 prescriptions with a total of 1652 drugs, only 8% (n= 138) were antibiotics. 20% (n=27) of the prescriptions contained antibiotic Amoxyclav. About 17% (n=23) of prescriptions contained Penicilline V antibiotic. While only about 1% (n=1) contained Mupirocin, Tobramycin, Colistin Sulphomethate, Nitrofurantoin antibiotics. These are shown in figure 4.

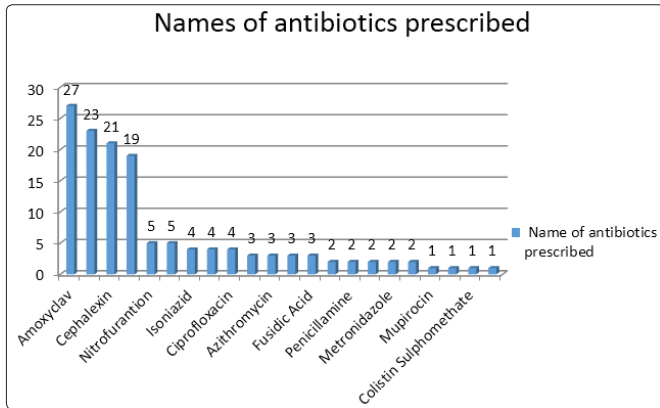


Figure 4: Antibiotics prescribed in children

Classes of Antibiotics Prescribed

The observed results showed that among a total of 138 antibiotic drugs, 22% (n= 30) were from class of Penicillins, followed by 19% (n=26) from Cephalosporins class and 1% (n=1) were from lincosamides class. These are shown in Figure 5.

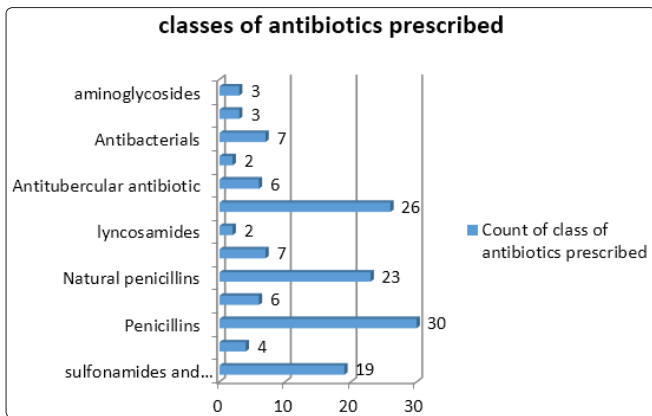


Figure 5: Classes of Antibiotics Prescribed

Names of Drugs Prescribed

The results showed that among a total of 800 prescriptions and a total of 1652 drugs, Prednisolone was the most prescribed drug for the children in tertiary care hospital amounting to about 5% (n=86), followed by salbutamol 4% (n=59) and lactulose 3% (n=48). The least prescribed drugs were 5-Hydroxy- Tryptophane, AQUADEKA Softgel Capsules, Auadeks Multivitamin, Cholestyramine and Diclofenac Sodium of 0.06 % (n=1). The prescribing pattern of individual drugs is shown in Figures 6,7 and 8.

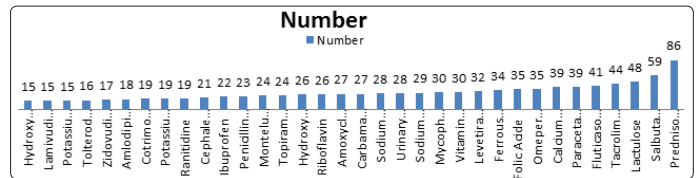


Figure 6: Names of drugs prescribed

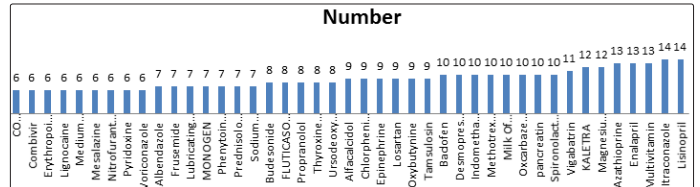


Figure 7: Names of Drugs Prescribed

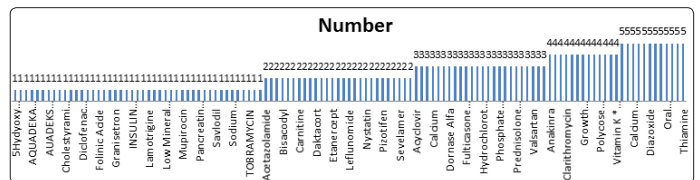


Figure 8: Names of Drugs Prescribed

Gender Distribution

A total of 800 pediatric prescriptions over a period of three months were randomly selected from the outpatient pharmacy of tertiary care Hospital and analyzed in a study. The gender distribution reflected that 55% (n=440) were male patients and 45% (n= 360) were females. The gender distribution is shown in Figure 9.

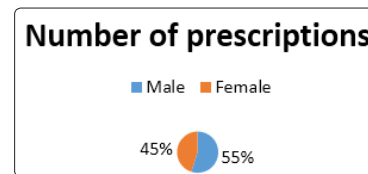


Figure 9: Gender Distribution

Route of Administration

The observed results showed that among 800 prescriptions having 1652 drugs, oral route of administration was the most common for pediatrics (about 91.8 %) (n=1518), followed by parenteral route of 5% (n=32) and topical route of 2% (n=32). The least route of administration used was ophthalmic route of 0.06 % (n=1). Results are shown in Figure10.

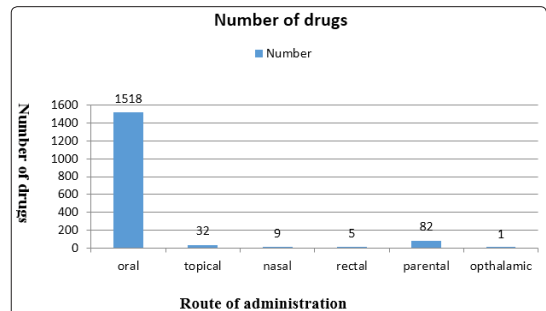


Figure 10: Route of Administration

Discussion

The present study analyzed 800 pediatric prescriptions selected randomly at a tertiary care hospital in Oman over a period of three months. The results of the study revealed that among 1652 prescribed drugs, only 8% (n= 138) were antibiotics, and 28% (n=464) of the prescriptions contained two drugs only.

The present study demonstrated that the most common category of the drugs prescribed were supplements (10.7 %) (n=177) followed by corticosteroids (10 %) (n=163), followed by antibiotics (8 %) (n =138).

The most common class of antibiotic prescribed was Penicillin (22%) (n=30), followed by Cephalosporins (19%) (n=26).

The most commonly prescribed antibiotic was Amoxyclav (20%) (n=27), followed by Penicilline V (17%) (n=23).

The present study demonstrated that Prednisolone was the most common drug prescribed to the children at a tertiary care hospital (about 5%) (n=86), followed by salbutamol (4%) (n=59).

The most common route of administration in this study was oral route (91.8%) (n=1518) and the least route of administration followed was ophthalmic route (0.06 %) (n=1).

Limitations of the Study

The study was done only in a single institution, so broad conclusion cannot be drawn and findings cannot be generalized for all the hospitals of Oman.

The dose, frequency and the strength of the drugs were not considered in the study. Only short period of time was used in the study. The rule of the hospital does not allow taking the prescriptions out of the pharmacy, which made it difficult to analyze in the allotted time.

Conclusion

The finding of the study highlighted that the prescribing in outpatient pediatric setting of a tertiary care Hospital were more for males children than females. The result of the study revealed that among 1652 prescribed drugs, only 138 were antibiotics, and 464 of the prescriptions contained two drugs only. The most commonly prescribed drugs were Prednisolone. The most common category of the drugs prescribed were supplements and the most common route of administration was oral route.

The study also, showed that the most common class of antibiotic prescribed was Penicillins and the most commonly prescribed individual antibiotic was Amoxyclav.

Recommendations

The mothers should take care about their children and give them healthy food rich in vitamins and essential minerals since the most drug classifications prescribed were supplements.

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