PRESCRIBING PATTERN OF DRUGS IN OUT PATIENT DEPARTMENT OF CHILD CARE CENTRE IN MORADABAD CITY

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ABSTRACT
Pediatrics differs from adult medicine in many respects. The obvious body size differences are paralleled by maturational changes. A prospective study was carried out on the prescriptions during Feb 2010 to May 2010 in Moradabad, U.P, selected randomly with a total of 223 prescriptions. The mean age of pediatric out patients was 3.85 years and male patients were 136 (61%) and female patients were 87 (39%). Majority of the pediatric patients were suffering from pneumonia 67 (30.18%) followed by diarrhea 30 (13.51 percent). A total of 882 drugs (including antibiotics) were prescribed to the total of 223 patients. 381 (43.19%) of drugs prescribed were antibiotics whereas the NSAIDS were only 126 (14.28%). Orally administered drugs contributed the highest proportion of drugs prescribed with 660 (75.28%) of total drugs. The average no. of drugs per prescription was 3.96 whereas average no. of antibiotics per prescription was 2.37. Cefotaxim was the leading antibiotic prescribed followed by Cefpodoxime. Cefadroxil was the highest antibiotic Prescribed in non - diagnosed patients. Combinations of antibiotics were prescribed to 75 (33.63%) patients. 87 out of 223 patients were prescribed the drugs up to Rs 40.00 per day. Appropriate drug utilization studies have been found to be crucial to evaluate whether drugs are properly used and utilized in terms of medical, social and economic aspects. Several guidelines designed to reduce the use of drug world- wide by means of various control strategies. Detailed knowledge of prescription pattern is important before the policies and measures can be implemented.
Keywords: Pediatrics, antimicrobial agents, neonates, disease.

INTRODUCTION

Children constitute about 40% of India's population. Infants and children suffer from frequent but usually non-serious illnesses. Most of these are self-limiting[1] and are often treated not only inappropriately, but also resorting to polypharmacy[2]. Infancy and childhood is a period of rapid growth and development. Compared to adult medicine, drug use in pediatrics is not extensively researched and the range of licensed drugs in appropriate dosage form is limited. Drug therapy is considered to be major component of pediatrics management in health care setting like hospital. Effective medical treatment of pediatric patient is based upon an accurate diagnosis and optimum course of therapy, which usually involves a medication regimen. 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[3,4]. The ultimate goal is to achieve rational and cost effective medical care, particularly in the economically developing countries. The key role of antibiotics for the treatment of infectious diseases that are prevalent everywhere in developing countries may not be denied. However, there are also reports of an irrational use of antibiotics[5, 6] which may even lead to infections that are worse than the originally diagnosed ones. The pediatricians and other medical personnel who provide health care for infants and children in developing countries confront a number of challenges during the day to day practice of medicine due to the shortage of appropriate drugs and other facilities. The rising incidence of bacterial resistance to common antibiotics, particularly, multi- drug resistant pneumococci, has prompted the need to use antibiotics judiciously in pediatrics practice. Many of the antibiotics are unnecessarily prescribed for viral infections such as common cold. In a Kentucky study, 60 percent of patients were prescribed antibiotics for the common cold[7]. Study conducted by Rehana[8] et al in B.P. Koirala Institute of Health Sciences, Dharan, Nepal shows that the average number of drugs per prescription was 5.26. Eighty four percent of all prescriptions contained anti microbial agent (AMA). Study done by Kafle[9] et al shows that 43 percent of cases was prescribed antibiotics. Similarly another study done in 1994 by Kafle[10] et al shows that 55 percent of cases were prescribed antibiotics. The focus of the study is the effective medical treatment of pediatric patients with accurate diagnosis and selecting the proper drug regimens, avoiding unnecessary use of antibiotics and minimize the prescription errors.

MATERIALS AND METHODS

The pattern of prescribing drugs was observed in the Out Patient Departments (OPD) of the CHILD CARE CENTRE, a pediatric hospital in Moradabad during Feb 2010 to May 2010. A prospective study was carried out on the prescriptions, selected randomly with a total of 223 prescriptions. Patient related parameters such as age, sex and body weight were recorded. The drug data such as name of the drug, dosage form, dosing frequency, duration, route of administration and diagnosis data were also noted. The data obtained & the patient related parameters were computed using Ms-Excel 2007. The results were expressed as percentage/proportion either as pictorial representation in the form of bar diagram & pie chart or in the tabular form. Mean were also shown & data is shown up to two significant decimal places.

RESULTS

The mean age of pediatric out patients was 3.85 years. The neonates were 18 (8.07%). The male patients were 136 (61%) and female patients were 87 (39%). The mean body

weight of patients was 13.73 kg. The distribution and proportions are as shown in table 1.

Table 1: Pediatric out Patients related parameters

Parameters	Number of Patients	Percentage
Age		
Neonates (up to 4 weeks)	18	8.07
Infants (4 weeks-1 year)	96	43.05
Children (1-6 years)	84	37.67
Children (6-12 years)	25	11.21
Sex		
Male	136	60.96
Female	87	39.04
Body weight		
Up to 6 kg	99	44.67
6-12 kg	84	37.86
12-18 kg	31	14.07
18-24 kg	9	4.04

Majority of the pediatric patients were suffering from pneumonia 67 (30.18%) followed by diarrhoea 30 (13.51 percent). Meningitis & enteric fever were diagnosed in equal no. of patients i.e. 18 (8.11%). 9 (4.05%) patients were not diagnosed; however they were prescribed the drugs. Hepatic problems were diagnosed mainly in neonates. The no. of patients diagnosed for combinations (e.g. diarrhoea+fever) were also significant.

A total of 882 drugs (including antibiotics) were prescribed to the total of 223 patients. 381 (43.19%) of drugs prescribed were antibiotics whereas the NSAIDS were only 126 (14.28%). Enzyme preparations were also prescribed in significant volume.

Orally administered drugs contributed the highest proportion of drugs prescribed with 660 (75.28%) of total drugs. Parenteral drug preparations were 143 (16.29%). Mostly inhalational preparations were given to patients with pneumonia.

Table 2: Diagnosis pattern no (%) in different age groups.

Diagnosis	Neonates	Infants	Children (1-6 yrs)	Children (6-12 yrs)	Total
	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)
Enteric fever	0	0	15(6.76)	3(1.35)	18(8.11)
Pneumonia	4(1.80)	39(17.56)	18(8.11)	6(2.70)	67(30.18)
Hepatic problems	6(2.70)	3(1.35)	0	3(1.35)	12(5.40)
Meningitis	0	6(2.70)	9(4.05)	3(1.35)	18(8.11)
UTI	0	3(1.35)	6(2.70)	0	9(4.05)
Diarrhoea	0	15(6.76)	8(3.60)	7(3.15)	30(13.51)
Not diagnosed	0	0	6(2.70)	3(1.35)	9(4.05)
Others*	6(2.70)	8(3.60)	13(5.85)	0	27(12.15)
Combination**	2(0.90)	22(9.91)	9(4.05)	0	33(14.86)

Others- Gastritis, rheumatic fever, pyrexia, pleural effusion, common cold, colic, throat infection, scabies, incidental ingestion, severe anaemia due to premature delivery, influenza, epilepsy, viral fever.*
*Combination**- Jaundice+pneumonia, vomiting+pneumonia, acuteglomerulonephritis+UTI, pneumonia +hypertension, diarrhea+fever, measles+diarrhea, diarrhea+COPD, enteric fever +malaria with ulcer.*

Figure 1:

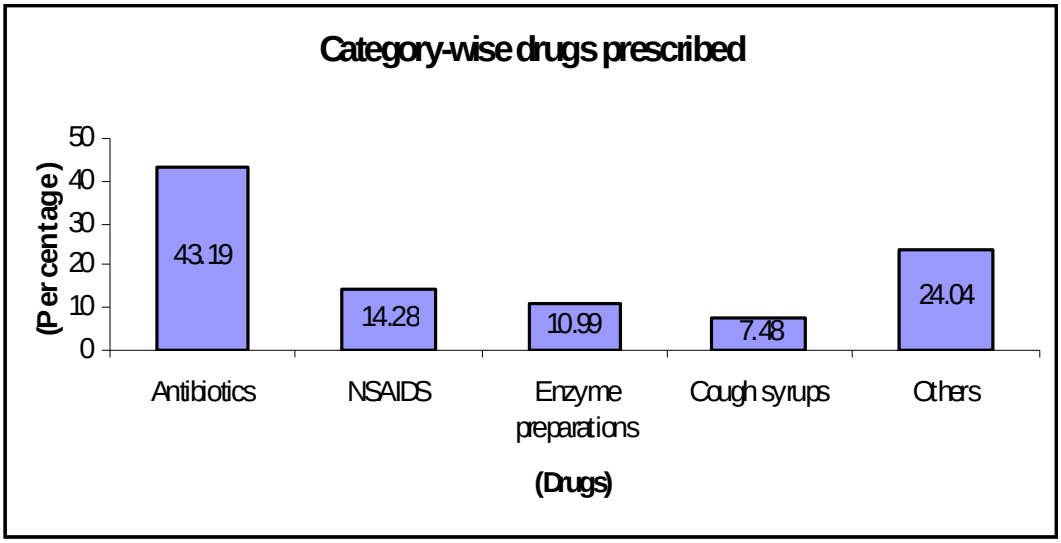
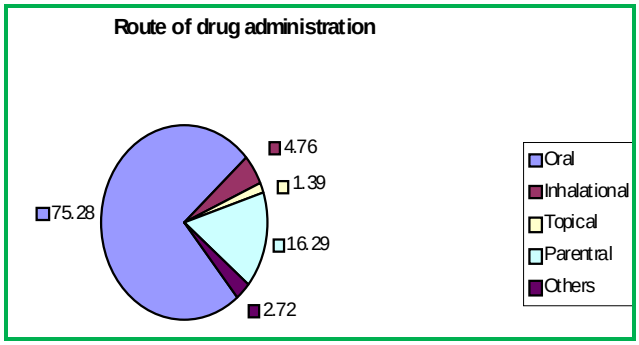


Figure 2:



As high as 93 percent of patients were exposed to at least two drugs. A major no. of patients (about 72%) was prescribed at least one antibiotic. The multiple antibiotics were found in 129 (57.84%) prescriptions whereas the single antibiotic was prescribed in only 32 (14.35%) prescriptions. Three antibiotics were observed in 213 (31.84%) prescriptions. No single antibiotic, but multiple antibiotics were administered to the pneumonia, Urinary Tract Infections (UTI) & meningitis diagnosed patients.

Table 3: No. of drugs per prescription.

Drugs/patient	No. of prescriptions	Percentage
1	15	6.73
2	36	16.14
3	39	17.49
4	57	25.56
5	48	21.52
6	15	6.73
7	13	5.82
Total	223	100%
Range	1-7	
Avg.no. of drugs	3.96	

Table 4: No. of Antibiotics per prescription

Antibiotics/ patient	No. of prescriptions	Percentage	No.of antibiotics
1	32	14.35	32
2	49	21.97	98
3	71	31.84	213
4	07	3.14	28
5	02	0.90	10
Total	161	72.20	381
Range	1-5		
Avg.no. of antibiotics	2.37		

Cefotaxim was the leading antibiotic prescribed followed by Cefpodoxime in the patients diagnosed with pneumonia. Penicillin (mainly Amoxycillin) was also prescribed significantly. Norfloxacin was prescribed in highest percentage in UTI whereas in meningitis, Gentamycin was prescribed highest followed by Cephalosporins & Penicillin.

Cefadroxil was the highest antibiotic Prescribed in non - diagnosed patients,while no Cefotaxime or Chloramphenicol was prescribed to them. Overall, Cephalosporins group of antibiotics was at the top to frequently prescribed followed by fluoroquinolones. Aminoglycosides 11% & penicillins 10 % were the other frequently prescribed antibiotics.

Figure 3:

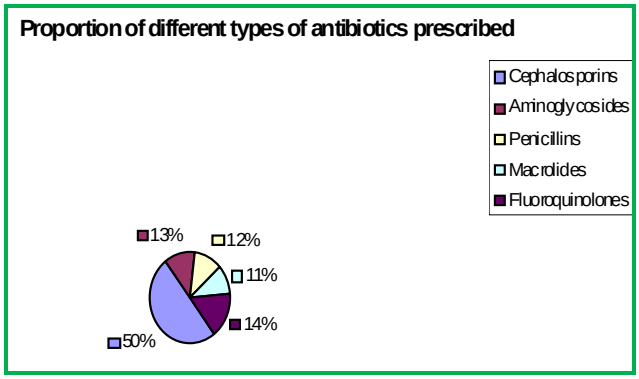


Table 5: Frequency (%) of individual antibiotic for specific diagnosis

Diagnosis	Cefpodox	Ceftriaxone	Norflox	Azithro	Genta	Cefotaxim	Cefadroxil	Amoxy	CPL	Others
Enteric fever	29	5	0	0	17	17	22	0	5	5
Pneumonia	19	5	0	3	9	21	0	15	16	12
Meningitis	22	17	0	6	28	0	0	11	6	11
Hepatic problem	0	8	0	8	8	17	0	42	0	17
UTI	11	0	66	11	0	0	0	0	0	12
Not diagnosed	11	11	11	11	11	0	22	11	0	11
Others	7	4	11	11	7	26	22	4	4	4
Combination	12	8	9	26	9	9	9	6	0	3

Cefpodox=cefpodoxime, Norflox=norfloxacin, Azithro=azithromycin, Genta=gentamycin, Amoxy=amoxicillin,CPL=chloramphenicol.

Others-Gastritis, rheumatic fever, pyrexia, pleural effusion, common cold, colic, throat infection, scabies, incidental ingestion, severe anaemia due to premature delivery, influenza,epilepsy, viral fever.

Combination -Jaundice+pneumonia, vomiting+pneumonia, Acute Glomerulonephritis +UTI , pneumonia+hypertension, diarrhea+fever, measles+diarrhea, diarrhea+COPD, enteric fever + malaria with ulcer.

Table 6: Most common antibiotics combinations

Combinations	Class of antibiotics	No. of prescriptions	%
Cefpodoxime + Amikacin	Cephalosporin + Aminoglycoside	07	9.33
Cefotaxim + Salbactum	Cephalosporin + Beta lactamase inhibitor	29	38.65
Amoxycillin + Clavulanic acid	Penicillin + Beta lactamase inhibitor	19	25.33
Ceftriaxone + Vancomycin	Cephalosporin + Macrolide	11	14.65
Amoxycillin + Cloxacillin	Penicillins	03	4.00
Others	……..	06	8.00
Total	……..	75	100

Combinations of antibiotics were prescribed to 75 (33.63%) patients, of which Cefotaxim in combination with Salbactum was at the top i.e. in 29 (38.65%) prescriptions. Amoxycillin with Potassium clavulanate was administered to 19 (25.33%) of the total patients, given in combination.

The prescription cost per day was quite economic.87 out of 223 patients was prescribed the drugs up to Rs 40.00 per day. Prescription of such patients was the highest with 39 percent.

Table 7: Cost (per day) of drugs.

Cost (in Indian Rs.) per day	No. of prescriptions	Percentage
0-40	87	39.01
40-80	59	26.46
80-120	28	12.56
120-160	32	14.35
160-200	13	5.83
More than 200	4	1.79
Total	223	100

DISCUSSION

Infants (4 week -1 year) comprised the highest proportion of the patients. Comparatively less cases of disease were found among the patient of age 6-12 year. The male patients were more as compared to the female patients. Hepatic disturbances & anaemia were the prevalent diagnosis among the neonates. Among the infants pneumonia was the most prevalent diagnosis. Diarrhoea, meningitis & enteric fever were mostly prevailing among the children. Majority (about 75%) of the drugs were administered orally whereas parentral route of administration was exposed in about 16% drugs (mainly intravenous route of administration). 40% of patients were prescribed up to 3 drugs which was less than that in the study carried out by N .Y. Mirza et.al[21] (i.e 46.7%) & rest 60% were prescribed 4 to 7 drugs. At least an antibiotic was prescribed in 72.2 % prescription which was less than the study done by Palikhe N et.al[18](i.e.93%) & comparatively more than the study done by Jason Hall[22] (i.e 60.6%). 3-5 antibiotics were prescribed to 35.9 % patients. Antibiotics were prescribed without investigation mainly based on clinical judgement with an average of 2.37 per prescription. At least an NSAID was prescribed to 14.28% patients. Among the antibiotics Cephalosporins were the most frequently prescribed class (43%). Gentamycin was found to be most common antibiotic to be prescribed with Cefpodoxime, Cefadroxil in enteric fever while in meningitis it was used with Amoxycillin & Potassium clavulanate. Cefotaxim with Salbactum & Ceftriaxone with Vancomycin were commonly administered in case of pneumonia. In the study only 16% of antibiotics were given by intravenous injection which was quite opposite to the study done by Thomas G[23] which indicated excessive use of injectables in many developing countries. Costs of prescriptions were quite economic which indicated the rational cost of the drugs. Only 49 (21.97%) patients were prescribed the drugs with cost more than Rs.120.00 per day. On the contrary the majority of the patients were prescribed drugs up to Rs. 80.00 per day, which included 146 patients (65.47%). Patients prescribed drugs up to Rs.40.00 were the highest in number.

CONCLUSION

Antibiotics are prescribed on clinical judgments in majority of the patients rather than taking the specimen of blood or urine for culture. It was also observed that antibiotics were prescribed by the physicians even in viral infections such as common cold, which shows the inappropriateness of prescribing antibiotics. The use of antibiotics is related to the antibiotics resistance, side effects& healthcare costs. Physicians must have a clear understanding of the therapeutic use of the antibiotics; they must be aware of the prevalence of the various pathogens & resistance patterns in hospital and exercise good judgement in selecting empirical antibiotic regimens. Antibiotics were also prescribed to the patients who were not diagnosed. Correct diagnosis of the disease and its management constitute important aspects of patient care which is even more important in case of pediatric patients.

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