



PRESCRIBING PATTERN OF DRUGS IN PAEDIATRIC INPATIENTS

Sivanandy Palanisamy^{*1}, Shanmugam Loganathan¹ and Arunachalam Sumathy²

¹Department of Pharmacy Practice, KMCH College of Pharmacy, Coimbatore-48, Tamilnadu, India.

²Department of Pharmaceutical Chemistry, Grace College of Pharmacy, Palakkad, Kerala, India.

*Corresponding author's E-mail: sivapalanisamy@yahoo.co.in

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ABSTRACT

Pediatrics differs from adult in many aspects of which body size and maturational changes plays an important role. Children are continually changing with respect to growth, psychosocial development and pharmacodynamic response. Children, and particularly neonates, differ from adults in their response to drugs. Special care is needed in ensuring the drug prescribed is appropriate and that the correct dosage is given, especially in the neonatal period. Main objectives were to identify co-morbidities, past and present illness in the study population and to study the trends in treatment of diseases in children. A total of 101 prescriptions were selected randomly from the pediatric ward for the study. The children below 12 years were included in the study. In this study male patients were predominant 66(65%) and female patients were 35 (34.65%). Most of the patients fall in the category of infant and children. Fever, measles tonsillitis and seizures were the common disease condition we observed in the study population. Majority of the pediatric patients had dehydration 17 (16.83%) followed by fever 09 (08.91%). A total of 356 drugs were prescribed to the study population. 95 (26.68%) drugs prescribed were antibiotics whereas the NSAIDs were only 75 (21.06%). Orally administered drugs contributed the highest proportion of the total drugs prescribed. Amoxicillin was the leading antibiotic prescribed. Combinations of antibiotics (amoxicillin and clavulanate potassium) were prescribed to 17 (16.83%) patients. Paracetamol was the commonly prescribed NSAIDs. Most of inpatient prescriptions have the ceftriaxone as a injection. BCG was prescribed as vaccines in few study subjects because they were infants and neonates and were in the need of vaccines. In this study we have seen some common drug interactions. Simple modifications were done to recover from the effects of drug interaction. 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 worldwide 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 form one of the largest groups of patients consulting general practitioners. It is estimated that every year about 18% of all GP consultations concern children less than 16 years of age. Children are continually changing with respect to growth, psychosocial development and pharmacodynamic response. Children, and particularly neonates, differ from adults in their response to drugs. Special care is needed in ensuring the drug prescribed is appropriate and that the correct dosage is given, especially in the neonatal period.^{1,2}

One of the leading causes of mortality worldwide is infectious diseases. In developing countries infants and children constitute a large proportion of this population and are among the most susceptible to such illnesses. This category of patients is also quite vulnerable to the harmful effects of drugs due to the differences in pharmacodynamics and pharmacokinetics. Antibiotic use has become routine in the treatment of pediatric infectious diseases, and several reports focusing on antibiotic prescribing practice in children from developed and developing countries indicated that between 50% and 85% of children received antibiotics. In these studies, almost half of all antibiotics prescribed were found to be inappropriate based upon clinical and financial criteria. Inappropriate use involves both overuse and under use

which may be responsible in part, for the rising global incidence of microbial resistance to commonly prescribed antibiotics.³

Studies from the U.S.A. and Canada have shown that the rate of antibiotic use in children less than 15 years of age was three times higher than any other age group, which clearly demonstrated that antimicrobial drug use was highest among children.³ In view of the emerging worldwide threat of bacterial antibiotic resistance, there is an increasing need to identify determinants and patterns of antibiotic prescribing to identify where clinical practice can be improved.³

Asthma usually begins in the first years of life and is the most common chronic disease of childhood in developed countries. In the United Kingdom (UK) and other developed countries there are some indications that the incidence of childhood asthma may have peaked at the end of the last century. Nonetheless, a large proportion of children are affected-an estimated 1 in 11 children in the UK and asthma is a common condition usually managed by general practitioners (GPs). Anti-inflammatory therapy is the cornerstone of pharmacotherapy for persistent asthma to counter the chronic airway inflammation that characterizes this condition. International and British asthma management guidelines recommend a stepwise approach to instituting and



adjusting daily controller (preventer) anti-inflammatory therapy, beginning with the dose of inhaled corticosteroid (ICS) appropriate to the severity of asthma.⁴

Clear communication of medication orders minimizes medication errors. Prescribers are encouraged to use these simple and standardized prescribing guidelines in order to ensure medication orders are clear and that the right drug in the right dose is given to the right patient at the right time, all the time.⁵ Main objectives of the study were to identify co-morbidities, past and present illness, prescribing pattern of drugs, and trends in the treatment of diseases in children.

MATERIALS AND METHODS

The study was conducted at a private corporate hospital for a period of six months. The authorization of the Chairman and Medical Director, KMCRET & KMCH were obtained to carry out the study.

Inclusion Criteria: Children below 12 years were included in the study.

Exclusion Criteria: ICU patients, terminally ill patients were excluded from the study.

A separate data entry format was designed. The drug chart was also included in the data entry format. Data were collected from patient's case sheet and transferred to data entry format for evaluation. The collected data were analyzed for its appropriateness and suitability. Interpretation was made on the collected data. From the data analysis, results were obtained and conclusion was drawn.

RESULTS AND DISCUSSION

A total of 150 children data's were screened for this study and 101 data were included, the rest of the data's were excluded because of lack of information's. Among the study subjects (n=101), 66 were found to be male and 35 were found to be female. It indicates that 2/3rd of the child patients receiving medical aid in this hospital was male.

Table 1: Royal College of Pediatrics and Child Health (RCPCH) Classification of children

Age in years	No. of children (%)	Sex Distribution (%)	
		Male	Female
Neonate (birth to 1 month)	8 (07.92%)	01(0.99%)	7(6.93%)
Infant (1 month to 2 years)	43 (42.57%)	29(28.71%)	14(13.86%)
Child (2 to 12 years)	50(49.50%)	36(35.64%)	14(13.86%)

As per RCPCH classification, most of the patients were fall in the category of child and the age between 2 and 12 years which is around 50 percent of the total study population. 42.57 percent were infants and 07.92 percent were neonates in this study population. Poor immune system development or under development of immune system in the infant and child group plays a major role in

acquiring disease (s) (table 1). All study subjects were admitted in the department of pediatrics, most of the patients in this study fall in the category of infants and children need careful diagnosis and treatment from the pediatrician. Therefore they were admitted in the department of pediatrics for better health care outcomes. Fever was the major reason for admission found in the study population, which was observed in 81 (80.19%) patients, and it is followed by nausea and vomiting in 42, cold and cough in 41 patients. This study was started in the early January, and the climate was very cold with few rainy days, this may be the reason for the children to get fever and cold (table 2).

Table 2: Reason for admission of the study population (n=101)

S. No	Reason(s)	No. of children (%)
1.	Fever	81(80.19%)
2.	Nausea and Vomiting	42(41.58%)
3.	Diarrhea	20(19.80%)
4.	Cold & Cough	41(40.59%)
5.	Swelling of limbs	3(02.97%)
6.	Dysuria	02(01.98%)
7.	Convulsions	06(05.95%)
8.	Abdominal pain	02(1.98%)
9.	Decreased urine output	10(9.90%)
10.	Rash over the body	4(3.96%)
11.	Throat pain	3(2.97%)
12.	Breathing difficulty	10(09.90%)
13.	Ear pain	5(04.95%)
14.	Difficulty in swallowing	1(0.99%)
15.	Hernia	1(0.99%)
16.	Lack of appetite	07(6.93%)
17.	Weakness	04(3.96%)
18.	Wheezing	01(0.99%)
19.	Allergic rhinitis	01(0.99%)
20.	Discharged eyes	02(1.98%)
21.	High colored urine	01(0.99%)
22.	Hematemesis	01(0.99%)
23.	Malena	01(0.99%)
24.	Bed injury	01(0.99%)
25.	Weight loss	01(0.99%)
26.	Snoring	01(0.99%)
27.	Body pain	01(0.99%)

Among the study population, dehydration was the common disease condition diagnosed, was present in about 16.83 percent of the total study population. Fever, tonsillitis, measles and seizures were the next common condition we observed in the study population. Second phase of the study was carried out in summer season, so the climatic condition in this locality was unfavorable for the children; therefore they developed with dehydration (17; 16.83%), fever (09; 8.91%) and tonsillitis (09; 8.91%). This may be the major reason for increasing admission in this hospital during the study period (table 3). In antibiotics, amoxicillin and ceftriaxone were commonly and equally prescribed and in NSAID's paracetamol was most commonly prescribed.



Table 3: Diagnosis of diseases in children (n=101)

S.No	Disease(s)	No. of children (%)
1.	Fever	09(8.91%)
2.	Nephrotic syndrome	01(0.99%)
3.	Diarrhea	07(6.93%)
4.	Bacteremia	02(1.98%)
5.	Infectious enteritis	04(3.96%)
6.	Dehydration	17(16.83%)
7.	Convulsions/ Seizures	08(7.92%)
8.	Gastritis	07(6.93%)
9.	UTI	07(6.93%)
10.	Viral pyrexia	05(4.95%)
11.	Measles	08(7.92%)
12.	RTI	03(2.97%)
13.	Viral pharyngitis	01(0.99%)
14.	Pneumonia	04(3.96%)
15.	Sinusitis	05(4.95%)
16.	Tonsillitis	9(8.91%)
17.	Bronchitis	05(4.95%)
18.	Glutamic aciduria	01(0.99%)
19.	Hernia	01(0.99%)
20.	Rt. Sided supportive parotitis	01(0.99%)
21.	Rt. Side empyema	01(0.99%)
22.	Rt. UL consolidation	01(0.99%)
23.	Cervical lymphadenopathy	01(0.99%)
24.	Urticaria	01(0.99%)
25.	AR adenoid hypertrophy	01(0.99%)
26.	Herpangina	01(0.99%)
27.	Early viral exanthematous fever	02(1.98%)
28.	Enterocolitis	01(0.99%)
29.	Early hemorrhage	01(0.99%)
30.	Diokyphoscoliosis	01(0.99%)
31.	C5 Absent pedicle	01(0.99%)
32.	Head injury	01(0.99%)
33.	Dengue fever	01(0.99%)
34.	Acute bacillary dysentery	02(1.98%)
35.	Microcephaly	01(0.99%)
36.	Global development delay	01(0.99%)
37.	Pertusoid cough	01(0.99%)
38.	Leukemia	01(0.99%)
39.	Typhoid fever	01(0.99%)
40.	Diabetes mellitus	01(0.99%)
41.	Brain granuloma	01(0.99%)
42.	Facial palsy	01(0.99%)

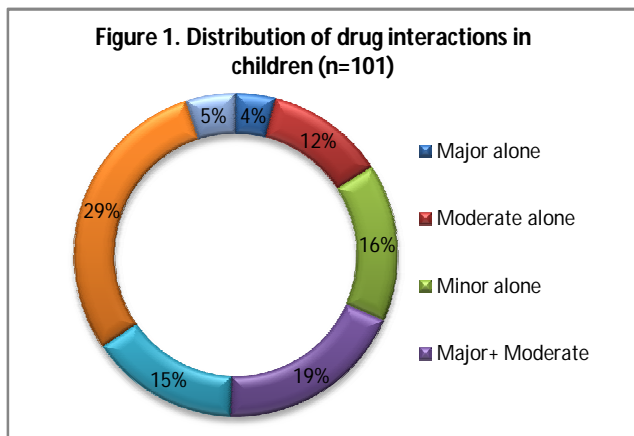
They may be prescribed for the treatment of fever, cold and chill. Anti-emetics (Ondansetron; n=27) and Minerals (Zinc; n=20) were commonly prescribed for the study subjects. BCG was prescribed as vaccines in few of the study subjects because they were infants and neonates and were in the need of vaccines. Anti-histamines and bronchodilator were the other commonly prescribed drugs in the study population (table 4).

Majority of the drug interaction found in the study population was moderate + minor, which is followed by Major, Moderate (n=19; 18.81%), Minor alone (n=16; 15.84%) and Major+ Minor (n=15; 14.85%), etc. Since it was minor and moderate drug interaction, no lethal effects were observed or notified. No adverse drug reactions were observed in the study population (figure 1).

Table 4: Distribution of prescribed drugs (n=101)

Class of drug, n(%)	Name of the drug	No. of children's (%)
Antibiotics	Cefixime	11(10.98%)
	Amoxicillin	17(16.83%)
	Ciprofloxacin	1(0.99%)
	Norfloxacin	01(0.99%)
	Clavulanate potassium	12(11.88%)
	Ofloxacin	01(0.99%)
	Cefoperazone	06(5.94%)
	Sulbactam	06(5.94%)
	Amikacin	03(2.97%)
	Erythromycin	02(1.98%)
	Ceftriaxone	17(16.83%)
	Cefotaxime	01(0.99%)
	Cefoperazone	03(2.97%)
	Cephalexin	01(0.99%)
	Azithromycin	01(0.99%)
	Trimethoprim +sulphamethoxazole	01(0.99%)
	Cefepime	01(0.99%)
	Neomycin sulphate	01(0.99%)
	Cefuroxime	04(3.96%)
	Cefadroxil	03(2.97%)
Ceftinir	01(0.99%)	
Linezolid	01(0.99%)	
NSAIDs	Paracetamol	65(64.35%)
	Diclofenac sodium	1(0.99%)
	Ibuprofen	8(7.92%)
	Ibuprofen & paracetamol	1(0.99%)
Narcotic analgesics	Tramadol HCl	1(0.99%)
Diuretics	Spiranolactone	1(0.99%)
	Frusemide	1(0.99%)
Anticonvulsant	Valproic acid	2(1.98%)
	Fosphenytoin	2(1.98%)
Antimalarials	Chloroquine phosphate	04(3.96%)
Antiemetics	Ondansetron	27(26.73%)
	Promethazine	3(2.97%)
	Domperidone	1(0.99%)
Hypnotics & sedatives	Clobazam	08(7.92%)
	Nitrazepam	01(0.99%)
Antiulcer	Pantoprazole	03(2.97%)
	Lansoprazole	01(0.99%)
	Ranitidine	05(4.95%)
	Sucralfate	02(1.98%)
Anticoagulants	Heparin	1(0.99%)
Laxatives	Bisacodyl	2(1.98%)
Multivitamins	Vitamin-A	2(1.98%)
	Folic acid	3(2.97%)
Minerals	Zinc	20(19.80%)
Anthelmintics	Albendazole	2(1.98%)
Vaccines	BCG	5(4.95%)
Antihistamines	Hydroxyzine HCl	3(2.97%)
	Citirizine HCl	7(6.93%)
	Azelastine	2(1.98%)
	Chlorpheniramine maleate	14(13.86%)
	Dexamethorphan	3(2.97%)
	Guaifensin	1(0.99%)
	Bronchodilators	Terbutaline & Bromhexine
Phenylpropanolamine		3(2.97%)
Phenylephrine		6(5.94%)
Salbutamol		20(19.80%)
Budesonide		05(4.95%)
Prednisolone		02(1.98%)
Codeine phosphate		03(2.97%)
Formeterol		01(0.99%)
Montelukast		01(0.99%)
Ipratropium bromide		01(0.99%)
Electrolytes	Oral Rehydration Salts	06(5.94%)
Antidiabetics	Insulin	02(1.98%)
Antifungal	Fluconazole	01(0.99%)
	Fluticazone	01(0.99%)
Nasal drops	NaCl ND	04(3.96%)
Topical agents	Silver sulphadioxide	01(0.99%)
Sympathomimetics	Adrenaline tartarate	01(0.99%)





CONCLUSION

This study concludes that all the study subjects were admitted in the department of pediatrics for the treatment of fever, cold and chill. Most of the patients fall in the category of infant and children. Fever, cold and cough were the common disease condition we observed in the study population. They were commonly prescribed with antibiotics, antipyretics and analgesics to alleviate the common ailments like fever, cold and pain. Multivitamins also prescribed in many study subjects as nutritious supplements, and they were prescribed with vaccines since they were pediatrics and were in the need of vaccines. Most of the drug interactions were fall in the category of moderate and minor. Simple modifications were done to recover from the effects of drug interaction like reducing or changing the dose, dosage or route of administration of drugs.

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