DOI: 10.7860/JCDR/2014/7134.4163

Original Article

Dentistry Section

Drug Abuse in Paediatric Dentistry: a Cross-Sectional Study

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ABSTRACT

Compared to adult medicine, drug use in children is not extensively researched.

Objective: The objective of present study is to find out drug prescribing pattern in the Department of Pedodontics and Preventive Dentistry and Orthodontics in teaching hospitals in Rajasthan, India.

Methods: A prospective study was conducted in June 2011. A total of 619 prescriptions were collected randomly. Prescribing pattern was analyzed using WHO basic drug indicator.

Results: The average number of drugs and antimicrobial agent prescribed per prescription were 2.24 and 0.81 respectively. Antimicrobial agent contained 81.74% of all prescriptions. Most common groups of drugs prescribed by pedodontist were NSAIDS & Antipyretics (37.7%), Antimicrobial (36.4%) and Vitamins (12.3%). Prophylactic use of antimicrobial agents was 5.5 ± 0.5 days. Fixed dose combination (45.6%) frequently used by brand name. Twelve percent generic drugs were used. Most of the drugs were from Essential Drug List especially a only one drug was prescribed.

Conclusion: There is a need of mass awareness amongst dentists about good prescribing habit. Every institution must have Drugs and Therapeutic Committees. The five steps of WHO Program on Rational Use of Drugs (RUD) should be followed for rational prescribing of drugs.

Keywords: Children, Drug, Prescription

INTRODUCTION

The use of various drugs, especially NSAIDS and antibiotics, has become a routine practice in treatment of paediatric illnesses [1,2]. As compared to adult medicine, drug use in children has not been extensively researched and the range of licensed drugs in appropriate dosage forms is limited. The key role of antibiotics in 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 [3,4], which may even lead to infections that were worse than the originally diagnosed ones. According to studies, 64% of the total antibiotics prescribed were either not indicated or were inappropriate in terms of drugs or dosage [5,6]. Because of an overall rise in the health care costs, lack of uniformity in prescribing drugs and the emergence of antibiotic resistance, monitoring and control of antibiotic use are a growing concern and strict antibiotic policies are warranted. Before such policies can be implemented, detailed knowledge on antibiotic prescribing practices is important. Providing regular therapeutic audits with feedback to the prescriber is important, to promote rational prescribing. Drug utilization data may be used to produce crude estimates of disease prevalence also. Although, a number of studies have been undertaken to study the drug-prescribing patterns of physicians, the data on the prescribing habits of dental practitioners is scarce [7]. The present study was conducted to find out the drug utilization patterns among children in dental OPD, in dental colleges of Jaipur (Rajasthan), India.

S. No.	Indicators
1	Average number of drugs prescribed per encounter
2	Percentage of drugs prescribed by generic name
3	Percentage of encounter when antibiotic was prescribed
4	Percentage of encounter when injections were prescribed
5	Percentage of drugs prescribed from essential drug list
6	Percentage of fixed dose combination versus single agent

[Table/Fig-1]: WHO basic drug-use indicator

METHODS

A descriptive study on analysis of prescriptions was conducted at Department of Pedodontics and Preventive Dentistry in five dental colleges of Jaipur for a period of six months, from June 2011 to December 2011. Prescriptions were randomly collected outside the departments in five dental colleges of Jaipur. The study design was approved by ethical committee. The sampling methodology which was adopted was convenience sampling. Out of 619 patients, 205 patients were selected from NIMS dental colleges and 415 patients were selected from the other four dental colleges. The prescribers were unaware of this.

Inclusion criteria

1. Children who were between the ages of 2 to 16 years
2. Children whose parents were willing to participate in the study
3. Children who did not have any systemic diseases

Exclusion criteria

1. Children who were below the age of two years.
2. Children whose parents were not willing to participate in the study.
3. Children who did not have any systemic diseases.

Relevant information from the prescriptions regarding patients and drugs were recorded on a customized data collection sheet. Fixed dose combination drugs were counted as single drugs. WHO–basic drug use indicators were used. [Table/Fig-1] Prescriptions of drugs which were prescribed from within essential drug list were also studied.

RESULTS

Total of 619 prescriptions were collected during the study period. Ages of patients ranged between 2 to 16 years. Average number of drugs that were used per prescription was 2.24. In 74 prescriptions, no drug was prescribed and the patients were only advised to

Drugs per prescription	No. of prescriptions	Total drugs	Antibiotics	Generic	Injection	FDC	Vitamin	EDI
0	74	Nil	Nil	Nil	Nil	Nil	Nil	Nil
1	92	92	Nil	28 (30%)	Nil	22 (23.9%)	16 (17.3%)	38 (41%)
2	294	588	260 (42%)	76 (13%)	Nil	315 (53.5%)	23 (3%)	70 (11.9%)
3	105	315	155 (25.0%)	35 (33.4%)	17	187 (59.3%)	98 (31%)	57 (18%)
4	25	260	48 (7%)	7	8	79 (30.3%)	69 (26.5%)	69 (26.5%)
5	24	125	32 (5.1%)	13	4	31 (24%)	17 (13%)	14 (11.2%)
6	5	30	11 (1.7%)	9	1	Nil	1 (20%)	Nil
Total	619	1390	506 (36.4%)	168	30	634 (45.6%)	224 (16.1%)	248 (17.8%)

[Table/Fig-2]: Distribution of type of drugs prescribed

S. No.	Groups	No. (%)
1.	Anti-microbial agents	506 (36.4%)
	Amoxicillin	217 (42.8%)
	a. Amoxicillin + Cloxacillin	127 (25.0%)
	b. Cephalosporin	74 (14.6%)
	c. Metronidazole	24 (4.7%)
	d. Amikacin	23 (4%)
	e. Fluconazole	14 (2.8%)
	f. Others	31 (6.1%)
2.	NSAIDS & Antipyretics	524 (37.7%)
3.	Antiplaque (Mouth wash)	56 (4%)
4.	Vitamins	172 (12.3%)
5.	Tooth paste (Medicated)	51 (3.6%)
6.	Topical Fluorides	42 (3%)
7.	Tannic acid (Gum Paint)	22 (1%)
8.	Others	31 (2%)

[Table/Fig-3]: Drugs which were prescribed most commonly (n = 1390)

S. No.	Groups	No. (%)
1.	Amoxicillin + Cloxacillin	94 (18.6%)
2.	Ibuprofen + Paracetamol	224 (42.7%)
3.	Diclofenac sodium + Paracetamol	194 (37.0%)
4.	Ciprofloxacin + Tinidazole	65 (10.25%)
5.	Ofloxacillin + Ornidazole	57 (8.9%)

[Table/Fig-4]: Fixed Dose Combinations most frequently used (FDC) (n = 634)

maintain proper oral hygiene. In all the prescriptions, diagnoses were mentioned. Two hundred ninty-four prescriptions contained two drugs and 105 prescriptions contained three drugs. The most common route of administration was oral route and in 4.8 % prescriptions, the parental route was used [Table/Fig-2].

Most common groups of drugs prescribed by pedodontists were NSAIDS and Antipyretics (37.7%), Antimicrobials (36.4%) and Vitamins (12.3%). Prophylactic use of antimicrobial agents was 5.5 ± 0.5 days. Among the antimicrobials, most commonly used drugs were Amoxicillin (42.8%), followed by Amoxicillin + Cloxacillin (25%) and Cephalosporin (14.6%). [Table/Fig-3] The results indicated that 70.4% of antibiotics were indicated for prophylactic purposes and that 29.6% were indicated for therapeutic purposes.

45.6% of total drugs were fixed dose combinations. Ibuprofen + Paracetamol (42.7%), Diclofenac sodium + Paracetamol (37%) and Amoxicillin + Cloxacillin (18.6%) were frequently prescribed fixed dose combinations [Table/Fig-4].

Vitamins were prescribed commonly when three or four drugs were prescribed [Table/Fig-3]. Patient characteristics such as name, age, sex, living area, past drug history and diagnosis, as well as drug details (name, dosage form, frequency, route and duration of administration) were recorded. Twelve percent generic drugs were used. Drugs from Essential Drug List were maximum, when one drug was prescribed (41%) and they were minimum when five drugs were prescribed (11.2%) [Table/Fig-3].

DISCUSSION

Prescription writing is a science and an art, as it conveys the message from the prescriber to the patient. The most vulnerable population groups which contract illnesses are infants and children. The use of antimicrobial agents, especially antibiotics, has become a routine practice in the treatment of paediatric illnesses [8,9]. Irrational prescription of drugs is a common occurrence in clinical practice, which may even lead to infections that are worse than the originally diagnosed ones [3,4,10]. The assessment of drug utilization is important for clinical, educational and economic reasons [11]. The most frequently used parameter for prescription analysis is average number of drugs per prescription [12]. In present study, the average number of drugs prescribed per prescription was 2.24, which is little higher than recommended dose (2.0 drugs per prescription) [13].

Most common groups of drugs prescribed by pedodontists were NSAIDS and Antipyretics (37.7%) and fixed dose combinations. Ibuprofen + Paracetamol (42.7%), Diclofenac sodium + Paracetamol (37%) were commonly used. The therapeutic value of a rational use of analgesics may not be questionable. However, overprescribing of analgesics/antipyretics not only poses potential adverse effects, it also consumes considerable amount of drug budget [14]. When the condition demands the use of such groups of drugs, it is preferable to use paracetamol rather than fixed dose combinations.

In the present study, antimicrobials (36.4%) held second position after NSAIDS and Antipyretics (37.7%). Hyperplastic pulpitis, acute periapical inflammation, abscesses, acute apical periodontitis, tooth extraction and RCT were common conditions for which antibiotics were prescribed. Most commonly used antimicrobials were Amoxicillin (42.8%), followed by Amoxicillin + Cloxacillin (25%) and Cephalosporin (14.6%).The average number of antimicrobial agents per prescription was 0.81. The number of antibiotics which were prescribed, increased with the number of drugs per prescription, which can lead to irrational prescribing [15]. For prescription of two or more antimicrobial agents, critical attitude is essential [16].

The results indicated that 70.4% of antibiotics were indicated for prophylactic purposes and that 29.6% were indicated for therapeutic purposes. The optimal timing for prophylactic antibiotic therapy is either or less than 24 hours [17]. In this study, the average duration of prophylactic use of antimicrobial agents was found to be 5.5 ± 0.5 days, which was longer than optimal time. It is necessary to do bacteriological examinations and sensitivity tests, when the infecting organisms are not identified by clinical examinations. In this study, it was found that 100% of antimicrobial agents were prescribed without any bacteriological support, which was in support of Moss et al's finding [18]. 17.8% drugs were prescribed from Essential Drug List of India. Prescription of essential drugs was reduced with increase in number of drugs per prescription. At present, the use of essential drugs needs to be improved.

In 3% of patients with a high caries rate or high risk assessment for caries (those undergoing orthodontic therapy), concentrated topical fluorides were prescribed for home use. When they are used as directed, fluoride can improve the oral health of children.

Consequently, physicians must keep a clear understanding of need for microbiological diagnosis, use of antibiotics and they should make good judgment in clinical situations. The habit of recording adverse drug reactions must be encouraged at all levels of health care institutions [19]. Increasing emphasis which has been laid on monitoring of therapeutic prescription practice training programmes may improve prescription practices and reduce frequency of prescribing errors [20].

CONCLUSION

The main challenges which are faced in prescription of antibiotics are to achieve a rational choice and appropriate use of antibiotics and to recognize their potential problems. Use of the five steps of WHO Program on Rational Use of Drugs (RUD) may prove to be helpful in overcoming these challenges to an extent. Every institution must have its own Drugs and Therapeutics Committee as has been suggested by WHO, so that patients will be benefited through decreasing economical burden, and adverse drug reactions and that by this, therapeutic effect will be increased.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Aug 06, 2013**
Date of Peer Review: **Nov 22, 2013**
Date of Acceptance: **Jan 18, 2014**
Date of Publishing: **Mar 15, 2014**