Prevalence of pharmacotherapy in the department of paediatric dentistry

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Abstract

Background: Pharmacotherapy plays important role in the management of paediatric dental patients in the department of paediatric dentistry. Many children at their early age suffer from different kinds of dental conditions such as acute and chronic irreversible pulpitis, acute and chronic alveolar abscesses, dentoalveolar and vestibular abscesses, etc along with physiological tooth movement that requires professional help for dental treatment. Treatment of such conditions most frequently requires pharmacotherapy as an either adjunct to dental therapeutic procedure or as a monotherapy.

Objective: To assess the prescribing patterns *vis-a-vis* generic or trade name, generic class, dosage form, route, frequency, duration, number of drugs per patient, cost and indication of drug therapy, patterns of dental treatment and Frankl's behavioral rating.

Materials and methods: Prescriptions of 200 paediatric dental patients undergoing dental treatment in the department of paediatric dentistry were analyzed prospectively for a period of six months in a dental teaching hospital.

Results: 133 (56.5%) patients were males and 87 (43.5%) females and age group 6-10 years was the most frequent group (70%, P=0.0000000) and all the patients received pharmacotherapy. Total numbers of 357 drugs were prescribed. Out of them, 212 (59.4%, P=0.0000008) were analgesic agents, 133 (37.3%) antimicrobial agents (AMAs) and 12 (3.3%) other drugs. Extended spectrum Penicllins were the most commonly prescribed (90.2%) AMA followed by Metronidazole (9.8%). 247 drugs (69.2%, P=0.0000000) were prescribed by trade names. 60% (P=0.0000002) drugs were prescribed in the form of tablet or capsule followed by syrup 37% and administered entirely through oral route. Percentage of patients receiving three drugs, two drugs and one drug was 13.5%, 56.5% (P=0.0000000) and 30% respectively and one patient received on average 1.78 medicines. 133 patients (56.5%, P=0.0000000) received both AMA and analgesic agent. Minimum to maximum number of days for pharmacotherapy were 2 to 15 and highest frequency was up to four times a day. Cost of medicines was in the range of 10-150 Nepalese Rupees. Chronic irreversible pulpitis was the commonest diagnosis (28%) and extraction (92.5%) was the commonest dental procedure. Frankl's behaviour rating showed that 78.5% (P=0.0000000) patients had positive attitude towards the dental procedures.

Conclusion: Findings of the study suggest that pharmacotherapy is the mainstay in therapy to treat the paediatric dental patients along with dental procedures either to control the dental pain or odontogenic infection. Age group 6-10 years, chronic irreversible pulpitis and dental extraction are the commonest age group, diagnosis and dental procedure respectively in the department of paediatric dentistry. Analgesic (non-steroidal anti-inflammatory drugs- Nimesulide, Ibuprofen and Paracetamol) and Amoxicillin are the most frequently prescribed drugs mostly in the solid dosage forms in trade names via oral route. Duration of pharmacotherapy ranges from 2 to 15 days with highest frequency being up to 4 times a day. Majority of the patients are manageable without any behavioural modification technique- physical or pharmacological.

Key words: Dentistry, Frankl's behaviour raring, Paediatric, Pharmacotherapy, Prescription

Drug therapy is an important factor for the success of any kind of dental therapy. Pharmacotherapy has indispensable role in the treatment of many medical and dental diseases. With the advent of new technologies in the field of dentistry, it's been very convenient to treat dental diseases. However, prescription of drugs is mainstay even during dental treatment both in paediatric and adult population as either adjunct in behaviour management[1], major therapy to treat infections[2] or to control dental pain.

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Child population suffers from frequent medical and dental illnesses. As reported by earlier studies, most of these medical illnesses are self-limiting[3] and are often treated not only inappropriately, but also resorted to polypharmacy[4]. Nevertheless, dental illnesses can be treated very effectively through dental therapeutic procedures accompanied by drug therapy. In the present context, dental practitioners and the patients are flooded with a vast array of pharmaceutical preparations with innumerable trade names. However, epidemiological evaluation of drug utilisation studies in dental paediatric population is limited. So, the assessment of drug utilisation pattern is important for clinical, educational and economic purposes[5] by which the ultimate goal is to achieve rational and cost effective dental care, particularly in the developing countries like Nepal.

This study was set to find the prescribing patterns of the drugs in regard to generic class, dosage form, dose, frequency, route, duration, cost and indication in children undergoing treatment in the paediatric dentistry department at a teaching dental hospital in eastern region of Nepal.

Materials and methods

This was a prospective study and carried out at B P Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal. Dental surgeons working in the department of paediatric dentistry were trained to record the data in a pilot-tested customised proforma. Prescriptions of the child patients visiting the department of paediatric dentistry were analyzed for a period of six months. Dental prescriptions were analysed for age, gender, number of drugs for each patient, generic or trade name, dosage form, dose, frequency, route, duration, cost and indication. Cost of each drug was calculated by referring to the Current Index of Medical Specialties (CIMS). Similarly, patterns of different types of dental treatments and Frankl's behaviour rating of the patients were also recorded as follows; definitely positive (++)- patients who had good rapport, were understanding and interested in dental treatments; positive (+)- patients who were tense co-operative, whining, timid and accepted treatment; negative (-) - patients who were immature, whining, timid and reluctant to accept treatment; definitely negative (--)- patients who were immature and uncontrollable, and showed defiant behaviour, cried forcefully and refused treatment[6]. Data were analyzed by Chi square test with Yates correction whenever appropriate and level of significance was set at ≤5 %.

Results

Out of 200 patients enrolled in this study, 133 (56.5%) patients were males and 87 (43.5%) females and age group 6-10 years was the most frequent group (70%, P=0.0000000) (Fig 1). All the patients received pharmacotherapy. Total numbers of 357 drugs were prescribed. Out of them, 212 (59.4%, P=0.0000008) were analgesic agents, 133 (37.3 %) antimicrobial agents (AMAs), 10 (2.8%) antiseptics and 2 (0.5%) vitamin B complex. Analgesic agents were entirely from non-steroidal anti-inflammatory group (Table 1 & Fig 2). Extended spectrum Penicllins were the most commonly prescribed (90.2%) AMA- Amoxicillin was most common (95%) - followed by Metronidazole (9.8%). 247 drugs (69.2%, P=0.0000000) were prescribed by trade names. 60% (P=0.0000002) drugs were prescribed in the form of tablet or capsule followed by syrup 37% (Fig 3) and administered entirely through oral route. Percentage of patients receiving three drugs, two drugs and one drug was 13.5%, 56.5% (P=0.0000000) and 30% respectively and one patient received on average 1.78 medicines. 133 patients (56.5%, P=0.0000000) received both AMA and analgesic agent (Fig 2). Minimum to maximum number of days for pharmacotherapy were 2 to 15 and highest frequency was up to four times a day. Different characteristics of pharmacotherapy such as names of drugs, dosage forms, doses, frequency, duration and cost are presented in table 2. Chronic irreversible pulpitis was the commonest diagnosis (28%) followed by exfoliative or physiological tooth mobility (27%) [details of diagnoses not shown]. Extraction (92.5%) was the commonest dental procedure carried out in the department of paediatric dentistry followed by pharmacotherapy only (2.5%) and endodontic treatment (2.5%) [details of treatment patterns not shown]. Frankl's behaviour rating of the patients showed that 64.5% (P=0.00000000) patients were positive whereas 2.5% patients were definitely negative (Table 3).

Table 1: Major pharmacotherapeutic groups of the drugs prescribed in the department of paediatric dentistry.

Group	No of prescriptions N=357	Percentage (%)
Analgesics *NSAID- Paracetamol, Ibuprofen and Nimesulide*	212	59.4
Antimicrobial agents *Penicillins* *Nitroimidazole*	133 *120* *13*	37.3 *90.2* *9.8*
Antiseptics *Chlorhexidine* *Povidone iodine*	10 *7* *3*	2.8 *70* *30*
Vitamin B complex	2	0.5

NSAID- Non-steroidal anti-inflammatory drugs

Table 2: The name, dosage form, dose, frequency, duration and cost of the drugs prescribed in the department of paediatric dentistry.

Drug	No of drugs prescribed (%) N =357	Dosage form & Dose	Frequency	Duration	Cost (NRS) / Range
Ibuprofen + Paracetamol	126 (35.3)	½ tab- 1 tab (500mg)/ 5ml-10ml	tid	3 -5days	10-30
Amoxicillin	114 (31.9)	cap 250mg-500mg/ 125ml/1tsp-2tsp	tid	5-7days	96-150
Paracetamol	73 (20.5)	½ tab -1 tab/250mg	tid	2 -5days	5-15
Metronidazole	13 (3.6)	tab 200mg-400mg	tid	5-7days	70-120
Ibuprofen	8 (2.3)	tab,200mg	tid	3days	20-36
Ampicillin + Cloxacillin	6 (1.7)	cap 500mg	qid	5- 7days	46-58
Nimesulide	5 (1.4)	tab100mg	bid	2days	6-12
Chlorhexidine 0.2%w/v	4 (1.1)	mouthwash 5ml -10ml	bid	7-10days	50-80
Povidone iodine 1%w/v	3 (0.8)	gargle 10ml	tid	10days	120-150
Chlorhexidine 0.2%w/w	3 (0.8)	gel 10gm	qid	7days	15-22
Vit B complex	1 (0.3)	syrup 5ml	bid	15days	54-80
Vit B complex	1 (0.3)	cap	od	10 days	60-84

cap- capsule, tab- tablet, tsp- teaspoon, stat - at once, od -once a day, bid-twice a day, tid- thrice a day, qid-four times a day, NRS-Nepalese rupees
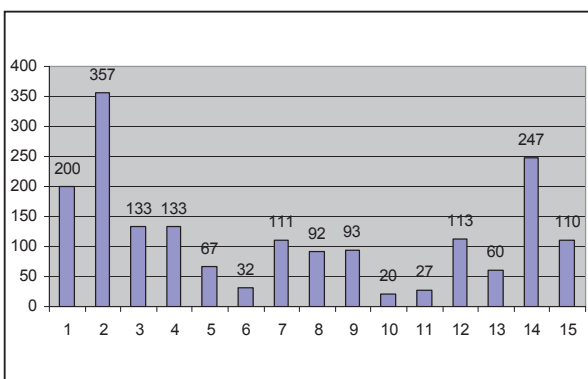
Table 3: Frankl's behavior rating of the patients in the department of paediatric dentistry.

| Rating	Number of Patients N=200	Percentage (%)
Definitely positive (++)	28	14
Positive (+)	129*	64.5
Definitely negative(--)	5	2.5
Negative (--)	38	19

*P=0.0000000
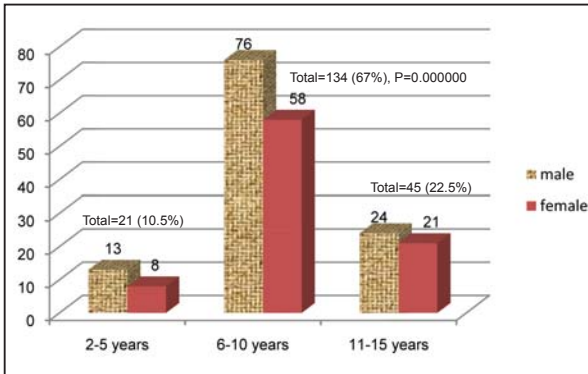
Fig 1: Age wise distribution of patients in the department of pediatric dentistry.

Fig 2: Number of patients and number of different drugs prescribed in the department of pediatric dentistry. 1- total patients who received drugs; 2- total no. of drugs; 3- AMAs prescribed; 4- patient who received AMA plus other drugs; 5- patient who received other drugs only; 6- AMA by generic names; 7- AMA by trade names; 8- AMA used in tab/cap; 9- one AMA; 10- two AMAs; 11- three AMAs; 12- three drugs; 13- two drugs; 14- one drug; 15- drugs prescribed by trade names. *AMA- antimicrobial agent, other drugs- antiseptics & vitamins*
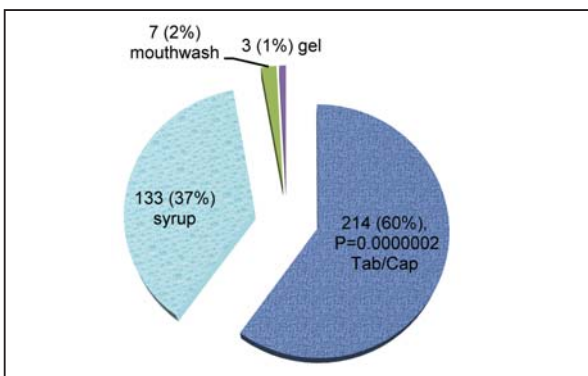
Fig 3: Dosage forms of the drugs prescribed in the department of pediatric dentistry

Discussion

Proper diagnosis of a dental condition and its management with medicine and dental procedure plays the pivotal role in paediatric dental care. For this it is germane to study the prescribing practices/patterns in paediatric dental patients in a bid to find out lacunae, if any, and suggest remedial measures to overcome the same. This study showed that all the patient visiting department of paediatric dentistry received pharmacotherapy alone or with dental therapy. In the study, on an average, 1.78 medicines were prescribed per patient. Though similar studies are lacking in the literature to compare this value, previous studies in paediatric (not in dentistry) patients showed that the average number of medicine per patient was 3.72[7], 2.3 and 1.4[8]. Based on this study, significantly higher number of patients (P=0.0000000) received two medicines and polypharmacy and over prescribing was not evident in the findings inasmuch as only 13.5% patients received three drugs.

Only 30.8% medicines were prescribed by generic (official) names. Similar studies had shown that the range of prescription by generic names was 6.32% to 43.9%[9] and 57.5% in hospitalized adult patients[11]. Prescription of the drugs either by generic name (non-proprietary) or trade name (proprietary) is highly argumentative topic. However, principle reasons for advocating the habitual use of generic names in prescription are clarity, uniformity, economy and convenience as proprietary names differ from country to country- the reasons are linguistic and commercial. In the contrary, the principle reason for advocating the proprietary names in the prescribing is consistency of the product so that the problems of quality, especially of bioavailability, are reduced. It is reasonable to use proprietary names when dosage, and therefore oral bioavailability, is critical so that even small variations in the amount of drugs available for absorption may have enormous effect on the patients, for example, drugs with low therapeutic index, Digoxin, hormone replacement therapy, Adrenocorticosteroids (oral), Antiepileptics, cardiac antidysrrhythmics and warfarin[12]. However, prescription of such drugs in dentistry is not usually encountered. Similarly, special dosage formulations such as sustained release formulation, enteric coated preparations, etc may warrant prescription by trade names and this may justify the use of trade names. Conversely, use of generic name during prescription writing should be advocated and practiced by the doctors as far as possible as prescribing medicines by generic names avoids the confusion and makes the medicine therapy rational and cheaper[12]. Moreover, in the teaching institutions worldwide, in textbooks, in scientific journals and in the research publications, medicines are always mentioned by generic names[9].

Present study showed that most of the prescriptions involved analgesics (59.4%) and antimicrobial agents (37.3%). Analgesics included entirely non-steroidal anti-inflammatory drugs (Paracetamol, Ibuprofen and Nimesulide) and antimicrobial agents included mostly the amoxicillin (95%). These findings are highly suggestive of the fact that pharmacotherapy in paediatric dentistry is mainly aimed to control dental pain and odontogenic infections. As per this study, cost of medicines was in the range of 10-150 Nepalese Rupees which seems to be reasonable and affordable amount (Table 2).

As the 67% patients were from age group 6-10 years and able to take solid dosage form of the drugs, prescription of majority of the drugs (60%) in the form of capsules or tablets is reasonable. Chronic irreversible pulpitis was the commonest diagnosis followed by exfoliative tooth mobility. Extraction was the commonest procedure followed by medication only and endodontic treatment. According to the study, dental pain associated with the pulpitis and mobility associated with the physiological exfoliation of teeth were the commonest factors that led to the visit of patients to the paediatric dentistry department for professional care. More than two thirds of the patients enrolled in the study were, behaviour wise, easily manageable for the dental treatment (definitely positive 64.5% and positive 14%) and no pharmacological measures were adopted for the behaviour management of definitely negative patients (2.5%). So as per this study, use of medicines was entirely for therapeutic purposes.

In conclusion, this study showed that pharmacotherapy was indispensable in paediatric dental care. Analgesics (Paracetamol, Ibuprofen and Nimesulide) and antimicrobial agents, mostly Amoxicillin, were the mainstay in pharmacotherapy in paediatric dentistry department and prescription of drugs by trade names in solid dosage forms was prevalent among prescribers. Duration of pharmacotherapy ranged from 2 to 15 days with highest frequency being up to 4 times a day. Additionally, age group 6-10 years, chronic irreversible pulpitis and dental extraction were the commonest age group, diagnosis and dental procedure respectively in the department of paediatric dentistry.

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