

Knowledge and Attitude of dentists towards antibiotic use in children: A cross-sectional survey

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Abstract

Introduction: Antibiotics form an important constituent of therapeutic clinical care in dentistry. However recent reports highlight a growing injudicious use and rise of antibiotic resistance, with 7%-11% of all common antibiotics prescribed by dentist alone. The American Academy and pediatric dentistry has regarding antibiotic usage laid down guidelines catering specifically to the needs of children. Thus, the objective of this study was to compare the antibiotic prescription pattern among dental practitioners and the awareness of antibiotic resistance in Delhi – NCR region.

Objective: To compare the antibiotic prescription pattern and the awareness of antibiotic resistance across various strata of dentists.

Materials and Method: A total of 120 dentists participated in the study. Inclusion criteria was willingness to participate and mentally competent to answer in written format, for a self-designed questionnaire containing open and closed ended questions. Chi- Square Test was applied.

Results: When comparisons were made between Interns and MDS it was found that there was a significant increase in the prescription of antibiotics among the MDS rather than Interns for most of the oral conditions except for a few conditions such as trauma (Interns =6.7% MDS = 11.7%).When asked about the exact dosage of medication to be provided to children only 3.3% did not know about it. Rest 41.7% Interns and 46.7% MDS prescribed it according to weight and age both 26.7% Interns and 35% MDS prescribed it according to weight alone, 13.3% Interns and 16.7% MDS according to age, 10% Interns and 6.7% MDS according to height only. For the management of oral conditions, it was found that the majority of dentists prescribed amoxicillin (73.3% Interns and 85 % MDS) as their first choice followed by alone or in combination metronidazole (6.7% Interns and 16.7% MDS), cephalosporin (5.0% Interns and 6.7% MDS), azithromycin, ciprofloxacin and erythromycin.

Conclusion: The results of the study highlight prevailing attitudes among dentists prescribing antibiotics to children. There exists ambiguity over correct antibiotic usage which should be dealt with appropriate understanding of disease, immune system & comprehensive knowledge of antibiotic medications.

Keywords: Antibiotic, Knowledge, Attitude.

Introduction

Antibiotics are essential and abundantly prescribed in daily dental practice because of their effectiveness and lifesaving benefits. However, the unnecessary use of antibiotics has been observed and has persisted as a major issue. Antibiotic overuse, incorrect dosing, and extended duration are some of the leading causes of antibiotic resistance. It has been found that dentists prescribe between 7% and 11% of all common antibiotics.^{1,2}

The American Academy of Pediatric Dentistry (AAPD) has published guidelines for antibiotic use, recognizing the increasing prevalence of antibiotic resistant microorganisms¹. The guidelines aim to provide guidance for the proper and judicious use of antibiotic therapy in the treatment of oral conditions in children. Pediatric patients require special dosing that is adjusted according to their body weight so that most common formula is mg/kg of body weight for the dosage of antibiotic.³

Over prescribing of antibiotics in children may be associated with unfavourable side effects ranging from gastrointestinal disturbances, fatal diarrheal cases and even anaphylactic shock⁴. It has been reported that the

over prescription of antibiotics in children is leading to increased fatal diarrheal cases and a drastic change in the sensitiveness of gut flora.¹ This growing problem has contributed significantly to the morbidity and mortality due to infectious diseases, with rising death rates for communicable diseases.⁵ The World Health Organization (WHO) recognized this global problem and announced the theme for the year 2011 as "Antibiotic resistance: No action today, No cure tomorrow".⁶

Exploration of scientific literature has revealed a scarcity of literature with trends of over prescription of antibiotics in the pediatric population, which provided an impetus to conduct this survey, the objective of which was to compare the antibiotic prescription pattern among dental practitioners (based on AAPD guidelines) and the awareness of antibiotic resistance among pediatric dentists.⁷ The increasing resistance problems of recent years are probably related to overuse or misuse of broad-spectrum agents.⁸

Materials and Method

This study was a cross-sectional survey conducted amongst dentists of Delhi NCR region. A validated, self-designed questionnaire was prepared to collect

information regarding the prescription pattern of antibiotics among dentists. The questionnaire contained both open-ended and close-ended questions. A total number of 120 dentists were included in the survey. A written informed consent was obtained from all the participants. The questionnaire comprised information pertaining to the following: Qualification and work experience, most common antibiotic prescribed, duration

and dosage, clinical conditions for which antibiotics were prescribed, awareness about antibiotic prophylaxis, awareness about antibiotic resistance and prescription of sugar free antimicrobials in children. The data obtained were compiled, tabulated, and subjected to statistical analysis. (Fig. 1) For the comparison of prescription pattern between interns and MDS, the chi-square test was used.

<h2>QUESTIONNAIRE</h2>	
<p>• Qualification: BDS MDS</p> <p>Years in practice: up to 5yrs 6-10yrs >10yrs</p>	
<p>1. Are you aware of the current guidelines for "Antibiotic prescription in pediatric patients?"</p> <p>YES NO</p>	
<p>2. Are you aware of the term "Antibiotic Resistance"?</p> <p>YES NO</p>	
<p>3. Are you aware of side-effects of routinely prescribed antibiotics in children?</p> <p>YES NO</p>	
<p>4. (a) Do you know the exact dosage of medication to be provided to children for dental dosages?</p> <p>YES NO</p> <p>(b) If 'YES'</p> <p>How do you recommended the dosages-</p> <p>(a)According to weight</p> <p>(b)According to age</p> <p>(c) According to height</p> <p>(d)Both a and b</p>	
<p>5. For how many days do you prescribe antibiotics?</p> <p>(a) 1 Days</p> <p>(b) 3 Days</p> <p>(c) 5 Day</p> <p>(d) 7 Days</p>	
<p>6. Which is the most commonly prescribed antibiotic by you?</p> <p>(a)Amoxicillin</p> <p>(b)Cephalosporin</p> <p>(c)Metronidazole</p> <p>(d)Erythromycin</p> <p>(e)Ciprofloxacin</p> <p>(f)Azithromycin</p>	
<p>7. Do you frequently prefer, in routine practice, to compensate the questionable sterilization of instruments used procedure by giving more antibiotic cover?</p> <p>YES NO</p>	
<p>8. Are you familiar with the term "ANTIBIOMA"?</p> <p>YES NO</p>	
<p>9. Do you take history of any drug allergy in pediatric patients before prescribing medication?</p> <p>YES NO</p>	
<p>10. For which <u>orodental</u> conditions do you prescribe antibiotics in children -</p> <p>(a)Oral-facial swelling</p> <p>(b)Pain</p> <p>(c)Trauma</p> <p>(d)Dental caries</p>	
<p>11. Do you feel, it is mandatory to prescribe antibiotic after every extractions?</p> <p>YES NO</p>	
<p>12. Do you prescribe sugar free antimicrobials in children?</p> <p>YES NO</p>	

Fig. 1: Questionnaire used in the study

Results

Out of total 120 dentists, 60 were INTERNS and 60 were MDS. The respondents in the prescribed time, filled and returned the Questionnaire (Figure1), the results of which were in the following manner. (Table1) For the question asked on prescription pattern for commonly encountered oral pathologies, a majority of respondents (70.0% MDS and 68.3% Interns) prescribed antibiotic for oral facial swelling while the least for dental caries for which only 1.7% of MDS practitioners prescribed antibiotics. Response towards the question asked about commonly prescribed antibiotics in children, the pearson chi-square was significant being 1.207.(Table 2)On being asked on the basis of prescription involving correct dosages for children 41.7% Interns and 46.7% MDS dentists

believed in prescribing antibiotics according to weight and age of the child. The pearson chi-square value for this question was 3.468 which was statistically significant. With regard to the duration of antibiotic prescribed, 65% Interns prescribed for 3 days, whereas 81.7% pediatric dentists (MDS) prescribed for 3 days, which was statistically significant. (Table 3) The pearson chi-square for this question was 7.675 which was statistically significant. For the management of oral conditions, it was found that the majority of dentists prescribed amoxicillin (73.3% Interns and 85 % MDS) as their first choice followed by metronidazole alone or in combination (6.7% Interns and 16.7% MDS), cephalosporin (5.0% Interns and 6.7% MDS), followed by azithromycin (3.3% MDS) and ciprofloxacin (1.7% Interns) and erythromycin (1.7% MDS) respectively

(Table 4). Pearson chi-square for this question was 7.230 which was statistically significant.

Table 1: Antibiotics prescribed for common Oro- facial conditions in children

Category Pathology	Interns		MDS	
	No.	% Age	No.	%Age
Orofacial swelling(a)	42	70.0%	41	68.3%
Pain(b)	12	20.0%	11	18.3%
Trauma(c)	4	6.7%	7	11.7%
Dental caries(d)	2	3.3%	1	1.7%

Table 2: Correct dosage for children

Category Recommendation	Interns		MDS	
	No.	% Age	No.	%Age
According to weight(a)	0	0%	2	3.3%
According to age(b)	21	35.0%	16	26.7%
According to height(c)	8	13.3%	10	16.7%
Both a and b(d)	6	10.0%	4	10.7%

Table 3: Duration of antibiotic Prescription

Category No. of Days	Interns		MDS	
	No.	% Age	No.	%Age
1 Days(a)	1	1.7%	1	1.7%
3 Days(b)	39	65.0%	49	81.7%
5 Days(c)	19	31.7%	7	11.7%
7 Days(d)	1	1.7%	3	5.0%

Table 4: Most commonly prescribed antibiotic by dentist

Category Name of Drug	Interns		MDS	
	No.	% Age	No.	%Age
Amoxicillin(a)	44	73.3%	51	85.0%
Cephalosporin(b)	3	5.0%	4	6.7%
Metronidazole(c)	10	6.7%	4	16.7%
Erythromycin(d)	1	1.7%	0	.0%
Ciprofloxacin(e)	0	.0%	1	1.7%
Azithromycin(f)	2	3.3%	0	.0%

Discussion

Most oral diseases presented to dentists are primarily inflammatory conditions. A considerable percentage of dental pain originates from acute and chronic infections of pulpal origin, which necessitates operative intervention rather than antibiotics.^{4,5}

However the awareness of guidelines for prescription of antibiotics was found to be low among the interns (35%) in contrast to the MDS practitioners (94%), when a study was done regarding the awareness of current guidelines for antibiotic prescription in pediatric patients. This calls for more emphasis and education amongst the Interns and upcoming Dentists for the prevailing guidelines of antibiotic prescription in children.

The most commonly used antibiotics in pediatric dental practice are amoxicillin, metronidazole, cephalosporins, azithromycin, ciprofloxacin and erythromycin. In the present study it was observed that

68.3% of the interns and 70% of the pediatric dentists (MDS) relied on Amoxicillin as the first choice which is in confluence with studies conducted by Karibasappa⁶ Montgomery,⁷ Gonul⁸ and Gregoire.⁹ Further, in the presence of anaerobic infection metronidazole was given in combination with amoxicillin by 6.7% interns and 16.7% of pediatric dentists (MDS). Similar finding were reported by Karibasappa⁶ and Gonul.⁸ Cephalosporin was the next choice (5.1% interns and 6.7% of MDS). Similar results were obtained in study conducted by Karibasappa,⁶ Gonul.⁸ Who suggested that ofloxacin, ornidazole and cephalaxim were preferred after metronidazole. There was a statistically significant difference between the prescription of combination of amoxicillin and metronidazole amongst the two groups which could be attributed to lesser exposure of combinations among the intern group.

In the present study, it was observed that 81.7% of the pediatric dentists (MDS) prescribed antibiotics for 3

days while 65% of the interns, while 5% of MDS and 1.7% of the interns prescribed antibiotics for 7 days. Rubenstein¹⁰ advocated short courses to long particularly when treating children as compliance with conventional regimen is usually poor.

The knowledge regarding the awareness of the term antibiotic resistance in both the groups was found to be adequate i.e. 96.7% of both the groups were known for this. Another alarming finding was found in interns (86.7%) who admitted to practice prescription of antibiotic to compensate a nonsterilized instruments in comparison to MDS practitioner (23.3%).

The reason to this could be attributed to instances where questionable sterility of a dental instrument is hurriedly compensated by injudicious antibiotic cover, even in those conditions which usually don't require any.¹⁰ However the results were not statistically significant.

Another distressing finding was that neither the MDS (30%) nor the interns (80%) were aware of the term sugar free antimicrobials and its prescription which made us realize that it needs a lot of effort and awareness among dentists especially the interns for the role and use of sugar free antibiotics in pediatric patients.

Conclusion

In the present study, for many oral conditions, there was an over-prescription in the Interns group when compared to the MDS group. This may have probably been due to inadequate understanding of the disease, less skill, and less competency in performing operative intervention measures. Regarding the use of metronidazole, the awareness pertaining to the anaerobic infection control was less in Interns which is also a significant finding in this study, as the freshly passed out graduates should be clinically oriented more towards such issues. It has to be understood that dental diseases are predominantly because of local factors; the mere removal of the local causative factors reduces the need for prescribing antibiotics considerably.

In conclusion, the prescribing practices of dentists can be improved by increasing awareness of the recommended guidelines among dental practitioners.

Prescription of antibiotics by interns should be carefully supervised by senior faculty members in order to reduce chances of inadvertent antibiotic prescription.

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