



RESEARCH ARTICLE

PATTERN OF ANTIBIOTIC PRESCRIPTION FOR PEDIATRIC DENTAL PATIENTS IN NORTH INDIA

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ABSTRACT

This retrospective study was carried out to examine the patterns of drug prescribing for pediatric dental patients in and around Moradabad, city, U.P. Methods: A total of 200 prescriptions were collected from various dental clinics from March 2014 to May 2014. Patients older than 12 years were excluded. Out of 150 diagnosed conditions, only 35 conditions were treated with antibiotics. The antibiotics were prescribed preoperatively on 28 occasions and for a post-treatment condition such as swelling antibiotics were prescribed on 7 occasions. Regarding the combination medicines Amoxicillin+clavulanic acid were mostly prescribed in pulpectomies and extraction patients. Conclusion: Present results indicate that prescribing trends for pediatric population seem to be rational. However, antibiotics are often not necessarily needed for treatment of dental conditions in children. Conclusion: excessive and inappropriate use of antibiotics should be avoided in pediatric dental clinics and pedodontist should have enough knowledge of pediatric pharmacology.

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INTRODUCTION

Antibiotic prescribing may be associated with various unfavourable side effects such as drug resistance, GIT disturbance, allergy, toxicity, anaphylactic shock. Hence, in the recent years there has been an increasing tendency to reduce the widespread use of antibiotics for prophylactic and therapeutic purposes. (Farber *et al.*, 1954) Children are susceptible to different oral and systemic diseases than adults, with vastly different drug metabolism. (Heidi Hills-Smith and Norman J. Schuman, 1983) The American Academy of Pediatric Dentistry (AAPD) has published guidelines for antibiotic use, to provide guidance for the proper and judicious use of antibiotic therapy in the treatment of oral conditions in children. (American Academy of Pediatric Dentistry Council on Clinical Affairs, 2013) The success of antimicrobial therapy depends on the serum concentration of the drug and the amount of it in infected tissue. Shorter the duration of drug intake lower is the risk of development of antibiotic induced side effects. (Mithra N. Hegde *et al.*, 2015) For children drug dosage is adjusted according to their body weight as mg/kg of body

weight. (Sapna Konde *et al.*, 2016) Based on literature there is indiscretion amongst dental practitioners with regard to the duration, drug choice, frequency and necessity of prescribing them in pediatric patients. Hence this study was done to assess the pattern of antibiotic prescribing for dental infections in children.

Aims and Objectives

A retrospective study was undertaken to assess the need of antibiotic use in children for a variety of dental treatment procedures.

MATERIALS AND METHODS

A retrospective study was carried out to evaluate the pattern of antibiotics prescribed to pediatric dental patients 2 to 12 years old children by Pedodontists for various pulpal and periapical conditions in various dental clinics of Moradabad city, U.P. Prescription sheets containing prescribed antibiotics issued to patients at dental clinics were gathered over a period of 3 months, making a final convenient sample of 200 prescriptions. A total of 406 procedures (pulp therapies such as pulpotomy and pulpectomy, and extractions) were carried out in the children for different pulpal and periapical pathologies

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(irreversible pulpitis, pulp necrosis and periradicular abscess). The information collected from the prescription sheets included timing of the antibiotic cover (preop, and post op), type of the antibiotic or a combination prescribed, frequency and dosage. Table 1 shows antibiotic dosage prescribed for children for different pulpal and periapical pathologies.

RESULTS

Table 2 & Figure 2 shows the Timing of antibiotic use based on pulpal diagnosis. Out of 150 conditions, only 35 conditions were treated with antibiotics; out of which 22 were diagnosed as periradicular abscesses, 11 as irreversible pulpitis and 2 as pulp necrosis. The antibiotics were prescribed preoperatively On 28 occasions and for a post-treatment condition such as swelling on 7 occasions.

Table 1 & Figure 1. Antibiotic dosage prescribed for children for different pulpal and periapical pathologies

Drug	Dosage	Frequency	Duration
Amoxicillin	40mg/kg/day in divided doses	TID	7-10days
Amox+ clavulanic acid	40mg/kg/day in divided	TID	7-10 days
Cefaxime	10mg/kg/day	BID	5-7 days
clindamycin	8-20mg/kg/day	TID	7-14days
Metronidazole	40mg/kg/day in divided doses	TID	7-14 days

Table 2. Timing of antibiotic use based on pulpal diagnosis

Diagnosis	No. of teeth involved	preop	Post op	Total Teeth
Irreversible pulpitis	125	8	3	11
Pulp necrosis	3	2	0	2
Periradicular abscess	22	18	4	22
Total	150	28	7	35

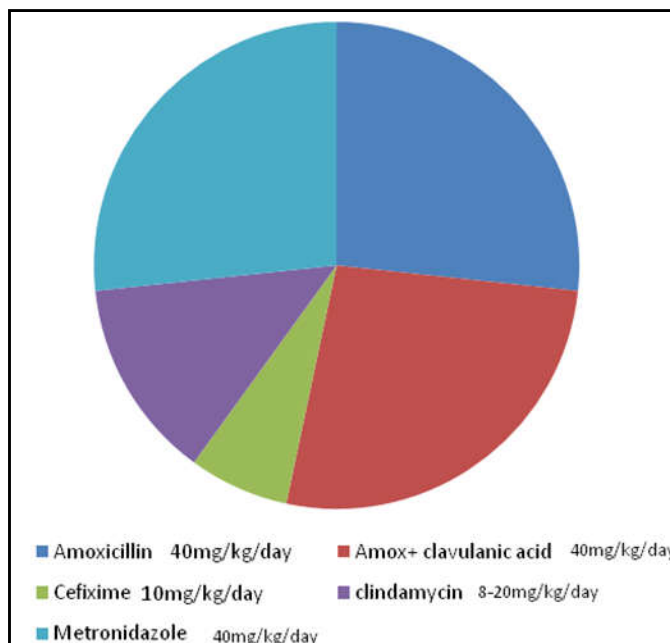


Figure 1.

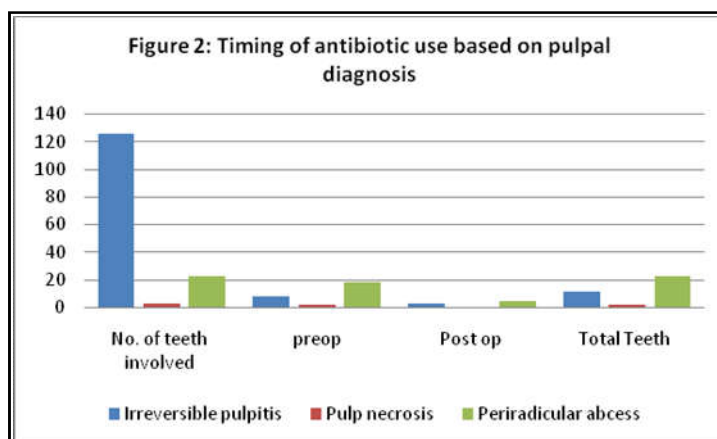


Table 3 & Figure 3 shows Antibiotic Combination Used based on the Pulpal Diagnosis: Amoxicillin+ Clavulanic acid was the most preferred combination followed by Amoxicillin+clavulanic Acid+ Metronidazole which was around 14 times and then Amoxicillin+metronidazole combination.

Table & Figure 4,5 report the use of antibiotics in pulpectomy, extractions and in all these dental procedures. mostly prophylactic antibiotic coverage was given in order to avoid any post procedure complications. Out of total 175 extractions, only 11 required post-operative antibiotics for infected wounds and 26 patients were prescribed provided preoperatively to prevent the possible complication of the infection.

Table 3. Antibiotic Combination Used based on the Pulpal Diagnosis

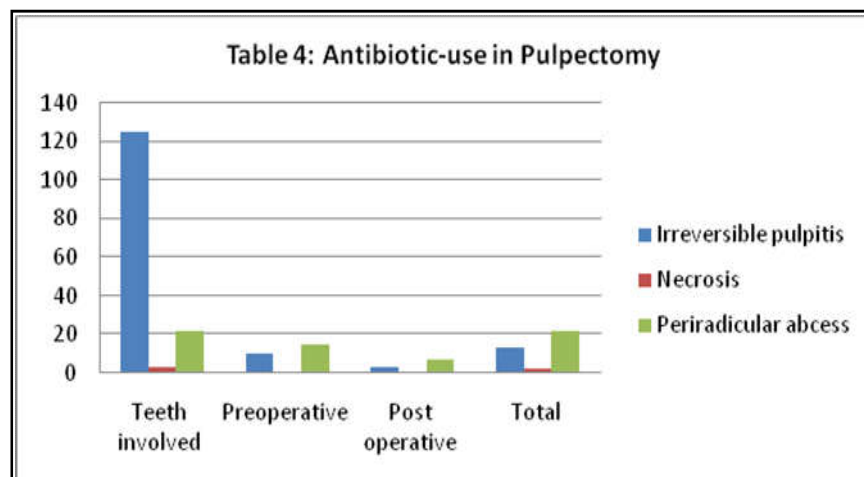
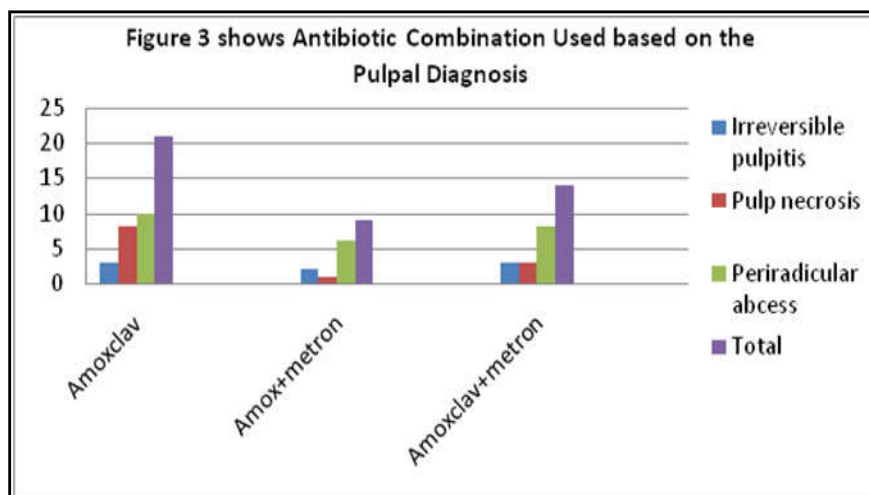
Antibiotics	Irreversible pulpitis	Pulp necrosis	Periradicular abscess	Total
Amoxicillin+clavulanic acid	3	8	10	21
Amoxicillin+metron	2	1	6	9
Amoxicillin+clavulanic Acid+ Metronidazole	3	3	8	14
Total	8	12	24	44

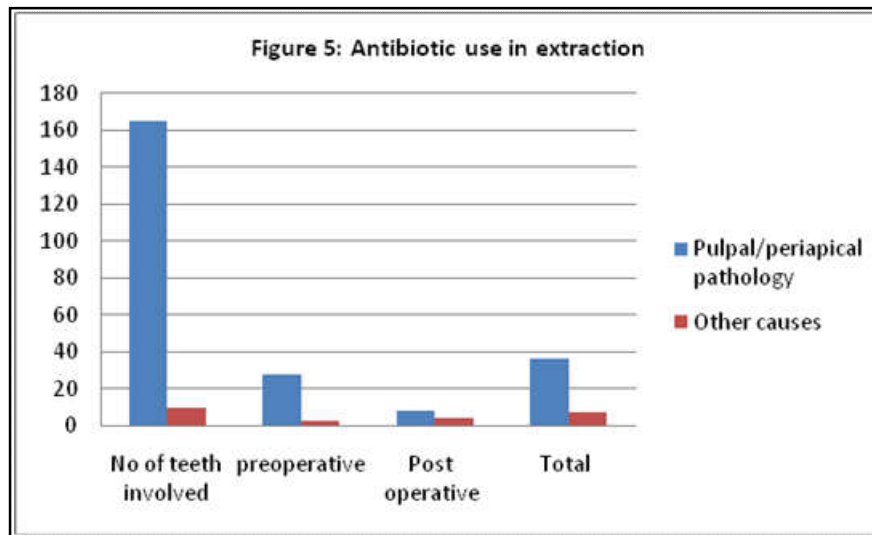
Table 4. Antibiotic-use in Pulpectomy

Pulpectomy	Teeth involved	Preoperative	Post operative	Total
Irreversible pulpitis	125	10	3	13
Necrosis	3	1	1	2
Periradicular abscess	22	15	7	22
Total	140	26	11	37

Table 5. Antibiotic use in extraction

Diagnosis	No of teeth involved	preoperative	Post operative	Total
Pulpal/periapical pathology	165	28	9	37
Other causes	10	3	5	8
Total	175	31	14	45





DISCUSSION

The use of antibiotics, has become a routine practice in the treatment of diverse infections in children. (Sanz *et al.*, 1989) Improper antibiotic use includes too low a dose, too long a duration, wrong choice of antibiotics, im-proper combination of antibiotics and therapeutic or prophylactic use in unwarranted/unproven clinical situations. (Adriane Kamulegeya *et al.*, 2011) Clinicians treat children with antibiotics primarily to treat oral infections and to prevent bacteremia caused by dental treatment. The goal of antibiotic treatment is to use the smallest amount of drug that is most effective against the organism that is causing the infection. (Leekha *et al.*, 2011) Antibiotic therapy for orofacial infections can achieve excellent results in selected clinical situations, but it should not be the primary treatment modality for orofacial infections unless spreading cellulitis is present. (Amponsah and Donkor, 2007) To prevent misuse of antibiotics, dentists need to know the indications and contraindications to prescribing them; the proper dosing schedule; and the risk of allergic and toxic adverse reactions, superinfections and development of antibiotic resistant organisms. (Dar-Odeh *et al.*, 2010) A major distinction between medical and dental conditions is that most dental infections can be treated successfully by removal of the source of the infection. With regard to dentistry, local drainage often may be sufficient to treat orofacial infections. This may involve removal of the infected tooth to achieve drainage through the socket or drainage through an incision in the area. (Carrotte, 2004) Clinicians should consider antibiotics as an adjunct to treatment when there are signs of systemic involvement such as diffuse swelling. Although no clear evidence exists regarding the optimum duration of antibiotic therapy, the AAPD Council on Clinical Affairs recommends that treatment be continued for a minimum of five days past improvement or resolution of the patient's symptoms. (Peedikayil, 2011) In many studies patients examined in an intensive care unit were found that those who received a shorter course of antibiotic therapy experienced fewer instances of antimicrobial resistance, super-infections or both compared with patients who received the longer standard antibiotic therapy. (Willian *et al.*, 2012) Widespread use of antibiotics by health care professionals and people in the livestock industry

has resulted in an alarming increase in the prevalence of drug-resistant bacterial infections; moreover, the increase in antibiotic resistance has contributed substantially to the morbidity and mortality associated with infectious diseases. Investigators in several studies found that children treated with an antibiotic were more likely to be colonized soon thereafter with bacteria resistant to the same antibiotic. (Ventola, 2015) More importantly, it appears that some type of resistance has been developed for all currently available antibiotics. Dentists and their medical colleagues can help address this growing and potentially devastating problem by prescribing antibiotics only when appropriate and necessary to resolve an infection. (Lodi *et al.*, 2012) Based on literature there is irregularity amongst dental practitioners with regard to the duration, drug choice, frequency and necessity of prescribing them. (Araghi *et al.*, 2016) Antibiotic prescribing may be associated with unfavourable side effects ranging from GIT disturbance to fatal anaphylactic shock and of resistance. (Karibasappa and Dr. Sujatha, 2014) The success of antimicrobial therapy depends on the serum concentration of the drug and the amount of it in infected tissue. Shorter the duration of drug intake lower is the risk of development of antibiotic induced toxicity, allergy and developing resistance. (Levison and Levison, 2009) Improper antibiotic use includes too low a dose, too long a duration, wrong choice of antibiotics, improper combination of antibiotics and therapeutic or prophylactic use in unwarranted/unproven clinical situations. (Adriane Kamulegeya *et al.*, 2011) The emergence of resistant strains is not only dangerous to the affected individual but also has serious public health implications. When the resistant strains affect the community, there is an added health care cost of changing to more expensive antibiotics. (Stuart B Levy and Bonnie Marshall, 2004)

Conclusion

When source of dental infection such as infected tooth is removed or treated, it can be handled without use of excessive antibiotics in children which in turn saves the patient from adverse effect of antibiotics. Hence the pedodontist should have an appropriate knowledge and hold on pediatric pharmacology.

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