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PRESCRIBING PATTERNS OF ANTIBIOTICS IN DENTAL PRACTICE

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ABSTRACT

Since there is a minimal knowledge on drug prescribing habits among dentists in general, the present investigation was undertaken to find out the prescribing patterns in dental practice. 500 prescriptions of dental patients attending the dental outpatient departments at DR.B.R.A.M.C, Bangalore were collected every day between September 2010 to February 2011. Males numbered 215 (43%) and females 285 (57%). Most of the patients were aged between 13-25 years. The dental disorders most frequently reported in our study were diseases of pulp and periapical tissue (17%), periodontal disease (39%), and dental caries (10%), tooth extraction (13%), rct (21%). Most commonly prescribing drugs are antimicrobials (66%) these drugs were prescribed for only 2-3 days which is inadequate. After reviewing the above prescription patterns, it was found that pattern of prescribing the drugs was not rational depending on the WHO criteria for rational use of drugs. Thus there is a clear need for the development of prescribing guidelines and educational initiatives to encourage the rational and appropriate use of drugs in dentistry

INTRODUCTION

Dentists prescribe medications for the management of a number of oral infections. Since most human orofacial infections originate fromodontogenic infections (Dar-Odeh *et al.,* 2008), the prescribing of antibiotics by dental practitioners has become an important aspect of dental practice (Laskin and Laskin, 1985). For this reason, antibiotics account for the vast majority of medicines prescribed by dentists Lewis (2008).The most common antibiotics prescribed by dentists are betalactams, macrolides, tetracyclines, clindamycin, metronidazole (Cleveland and Kohn, 1998).

Microbial resistance to antibiotics is an increasingly important public health issue, prompting recent reports from high profile bodies in the UK (Select Committee on Science and Technology, 1998; Standing Medical Advisory Committee, 1998). Inappropriate prescribing of antibiotics within the primary care setting is a major cause of drug resistance. Such misuse includes incorrect dose and duration of antibiotic therapy, inappropriate choice of antibiotic and the use of an antibiotic in unwarranted clinical situations (Select Committee on Science and Technology, 1998; Standing Medical Advisory Committee, 1998). The misuse of these agents leads to increased incidence of adverse effects, emergence of resistant strains and increase in cost of therapy (Craig *et al.,* 1978). Also irrational prescription of drugs is of common occurrence in clinical practice (Ramsay, 1993). The study of prescribing pattern is an important component of medical audit which helps in monitoring; evaluating and making necessary modifications in the prescribing practices to achieve a rational and cost effective medical care (WHO, 1979). General dental practitioners prescribe regularly antibiotics for management of oral and dental infections. There has been a worrying increase in the level of antibiotic resistance among organisms in the oral cavity. The present study was undertaken in the OPD of Dr.B.R. Ambedkar Dental College Bangalore to find out the antimicrobial prescribing pattern and generate a data on the extent of rational/irrational prescribing.

MATERIALS AND METHODS

The study was carried over a period of 6 months in the dental OPD, Dr.B.RAmbedkar dental college, Bangalore. Information regarding patient's age, sex, diagnosis, treatment, antibiotic name, dose and

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duration were recorded. The data was analysed as percentage of antimicrobials used among patient categories defined by diagnosis and their rationality was assessed (Walker *et al.,* 1990; and WHO, 1993). The study was approved by the institutional ethics committee.

RESULTS
Prescribed drugs between Sep to Feb. 2011 are antimicrobials and analgesics. Antibiotics include Amoxycillin and Metronidazole. Females contributed a larger part of the study; up to 57 % the mean age was between 20±10.The dental disorders most frequently reported in our study were diseases of pulp and periapical tissue (17%), periodontal disease (39%), and dental caries (10%) and procedures such as tooth extraction (13%), RCT (21%). Most commonly prescribed drugs are antimicrobials such as amoxicillin and Metronidazole and analgesic such as Diclofenac. Antibiotics were prescribed for only 3-4 days and analgesics for 2-3 days. (See table 1)

Table 1: Conditions, no of patients, drugs prescribed, dose & duration

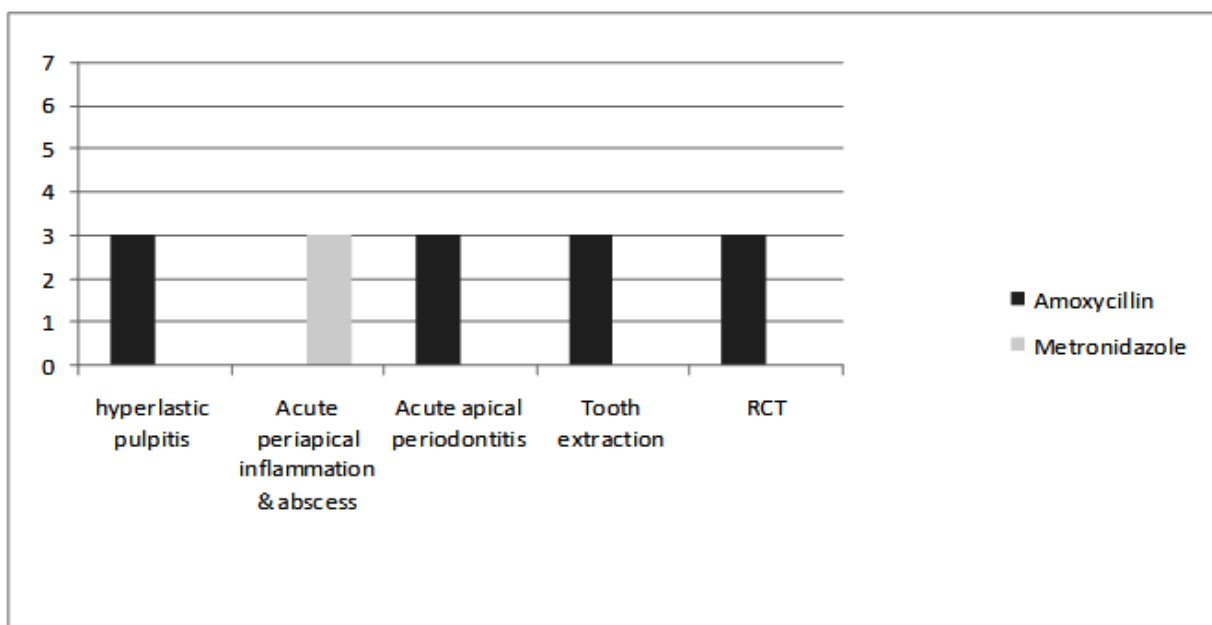| Condition /procedures	No of Patients	Drugs prescribed	Dose	Duration
Hyperplastic pulpitis	38	Amoxicillin	500mg	3 days
Acute periapical inflammation and abscess	47	Metronidazole	400mg	3-4days
Acute apical periodontitis	194	Amoxycillin	500mg	3 days 3 days
Tooth extraction	66	Amoxicillin	500mg	3 days
RCT	105	Amoxycillin	500mg	3 days

Figure 1: Duration of antibiotic usage in Orodental infections

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DISCUSSION

The irrational use of drugs is a major problem of present medical practice and its consequences include ineffective treatment, development of treatment, adverse effects and economic burden on patients. The dental profession should be aware that antibiotic resistance is an emerging problem created largely by overuse and inappropriate use of antibiotics.

According to WHO guidelines antibiotics such as amoxycillin 500mg should be prescribed twice daily for at least 5days and metronidazole 500-750mg three times daily for 7 days (WHO, 1979).According to the British National Formulary (Ahmed-Jushuf *et al.,* 2009) Co-amoxiclav250 mg every 8 hours, doubled in severe infections may be used for severe dental infection with spreading cellulitis or dental infection not responding to first-line antibacterial treatment; CHILD up to 10 years, 125 mg every 8hours, doubled in severe infections. For otitis media, 1 g every 8 hours; CHILD 40 mg/kg daily in 3 divided doses (max. 3 g daily), dental abscess, 3 g repeated after 8 hours.

Phenoxymethylpenicillin is effective for dentoalveolar abscess- 500 mg every 6 hours increased up to 1 g every 6 hours in severe infections; CHILD up to 1 year 62.5 mg every 6 hours, increased up to 12.5 mg/kg every 6 hours in severe infections; 1–6 years, 125 mg every 6 hours, increased up to 12.5 mg/kg every 6 hours in severe infections; 6–12 years, 250 mg every 6 hours, increased up to 12.5 mg/kg every 6 hours in severe infections (Ahmed-Jushuf *et al.,* 2009).

Metronidazole is an alternative to penicillin for the treatment of many oral infections where the patient is allergic to penicillin or the infection is due to beta-lactamase-producing anaerobes. It is the drug of first choice for the treatment of acute necrotising ulcerative gingivitis (Vincent's infection) and pericoronitis; suitable alternatives are amoxicillin and erythromycin. Anaerobic infections (usually treated for 7 days and for 7–10 days in *Clostridium* difficile infection), by mouth, either 800 mg initially then 400 mg every 8 hours or 500 mg every 8 hours. Acute oral infections, by mouth, 200 mg every 8 hours for 3–7 days; CHILD 1–3 years 50 mg every 8 hours for 3–7 days; 3–7 years 100 mg every 12 hours; 7–10 years 100 mg every 8 hours. But in the present study all were prescribed antibiotics only for 3days which is insufficient which may lead to emergence of resistance (Ahmed-Jushuf *et al.,* 2009).

The data reveal dentists prescribing a wide spectrum of antibiotics and, in agreement with previous studies (Barker and Qualtrough, 1986; Thomas *et al.,* 1996; and Muthukrishnan *et al.,* 1996). There was considerable variation from the recommended frequencies and doses. The dose and the duration of therapy are key factors in modulating the selection pressure for antibiotic resistance. It is essential that antibiotics be prescribed at the correct frequency so that the minimum inhibitory concentration is exceeded and the infecting bacteria are killed rather than merely inhibited. Use of doses that are too small or treatments that are too long having recently been shown to increase the risk of selecting resistant strains (Muthukrishnan *et al.,* 1996).

Our results indicate that there is a considerable scope for improving the antimicrobial prescribing pattern, thereby minimizing the emergence of resistance. This could be achieved by introduction of a hospital formulatory mentioning antibiotic guidelines and a drug information centre at college level, which could help the prescriber to review the prescribing practices and to facilitate better health care delivery and avoid drug resistance which is very commonly encountered now a days and decreasing irrational drug use.

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