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Assessment of Knowledge, Attitude and Practice of Antibiotic Prescription Pattern by Dental Professionals in Central India - A Cross Sectional Study.

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# **Conflicts of Interest:** Nil

# Abstract

**Aim:** To assess the pattern of antibiotic prescribing practices amongst general dental practitioners and specialists.

# Material and a Methods

- Study Design: A Cross Sectional Study.
- Study Population: Dental practitioner holding the Bachelor of Dental Surgery (BDS), Master of Dental Surgery (MDS) degree and Super specialist.
- Sample technique: Convenience Sampling.
- Sample size: 160.Validation of questionnaire was done by two expert & approved by institutional ethic committee (IEC/ 04/ 01) and was given to targeted population. A questionnaire containing different pattern

of Anti biotics Prescription by Dentists, Different combination of antibiotics use, Their dose & Frequency.

- Inclusion criteria: Any dental practitioner holding the Bachelor of Dental Surgery (BDS) and Master of Dental Surgery (MDS) degree Participants welling to participate in study.
- Exclusion Criteria: Included other than dental professional and not welling to participate in study. **Results:** 70.7% of dentist pursuing MDS stated that their antibiotics prescription does not depends on patients preferences. Among the dentists, 63.4% pursuing MDS write the antibiotic Generic name in the prescription other than Brand name.

Corresponding Author: Dr. Kunal Jayavant Fule, ijdsir, Volume – 6 Issue - 2, Page No. 241 - 247

59.8% of dentists pursuing MDS agree with that Not prescribing Antibiotics can lead to spread of infection. 81.7% of pursuing MDS state that they do not influence by advertisement or marketing on of antibiotics prescription

**Conclusion:** It is concluded from the present study that the knowledge of scientific basis for the prescription of antibiotics is must for every dentist.

The current guidelines for antibiotic prescriptions should be strictly followed. Antibiotics, when judiciously used, are precisely lifesaving drugs. Professional awareness programs for the dentists regarding antibiotics may prevent misuse & drug resistance.

**Keywords:** Anti biotics Prescription, Awareness, Dentist, Overuse, Resistance.

#### Introduction

The word "anti biotic" is a combination of the terms "anti," which means "against," and "biotic," which means "life."

The best way to treat different Odontogenic infections is with the appropriate combination of medications and surgical treatment. "It is not difficult to make microbes resistant to penicillin in the laboratory by exposing them to concentrations not sufficient to kill them, and the same thing has occasionally happened in the body,"

Alexander Fleming, who shared the 1945 Nobel Prize in Physiology and Medicine with Howard Florey and Ernst Chain, said in his lecture "(1).

An essential part of routine dental practise now involves the prescription of antibiotics by dental professionals.

This explains why a sizable portion of the medications that dentists prescribe are antibiotics. Although dentists prescribe 10% of all common antibiotics, it has been noted that their contribution to the issue of antibiotic resistance can be significant (2). Dental professionals regularly face oral infections for which anti biotics are frequently recommended. Anti biotics are helpful, but they can also be a double-edged sword because improper use can lead to issues (3). Dentists typically prescribe antibiotics for shorter durations as a replacement for the definitive therapy, despite the fact that it is still thought of as an adjuvant to the treatment (4).

There have been several inquiries on the extent of the usage of antibiotic prophylaxis in dentistry as a result of greater awareness of antibiotic resistance (5).

The methicillin-resistant Staphylococcus aureus and vancomycin-resistant Staphylococcus aureus are the most well-known examples of broad resistance, and we have now entered an era where some bacterial species are resistant to the complete spectrum of antibiotics now accessible (6).

The current study will look into dentists' prescription habits for anti-biotics. The aim of the present study was to assess the pattern of antibiotic prescribing practices amongst general dental practitioners and specialists.

## Materials and methods

The present study was designed as a cross-sectional study performed among the dentists. Ethical clearance was done from institutional ethic committee (IEC/04/01) Government Dental College and Hospital, Nagpur.

The study had a sample size of 160 dentists. Inclusion criteria Any dental practitioner holding the Bachelor of Dental Surgery (BDS) and Master of Dental Surgery (MDS) degree.

Participants welling to participate in study. The exclusion criteria included other than dental professional and not welling to participate in study.

A questionnaire containing different pattern of Anti bio tics Prescription by Dentists, different combination of anti-biotics use, their dose & frequency. Validation of

questionnaire was done by two expert and were given to targeted population.

Questions (figure 1, 2) was constructed using Google form and link was generated that was emailed to dentists. Study was conducted over a period of 2 months. The data were statistically analyzed.

## Results

Present survey link was e-mailed to 160 dentists, out of which 160 dentists completed the survey, thereby achieving a response rate of 100 %. Responders of present survey included 40% males and 60% females with age group between 26 to 32 mostly.

31.3% respondents where BDS Graduate, 13.30 were MDS and Majority of the respondents were Pursuing MDS with 54.7 %

• 70.7% of dentist pursuing MDS stated that their antibiotics prescription does not depends on patients' preferences (Graph 1).

• 63.4% dentist pursuing MDS write the antibiotic Generic name in the prescription other than Brand name (Graph 2).

• 59.8% of dentists pursuing MDS agree with that Not prescribing Antibiotics can lead to spread of infection (Graph 3).

• 81.7% of dentist pursuing MDS state that they do not influence by advertisement or marketing on of antibiotics prescription (Graph 4).

### Discussion

The choice to provide an antibiotic or antimicrobial medication to treat an Odontogenic infection depends on a number of variables.

The dentist must first identify the source of the infection before choosing the best dental treatment, which may involve a variety of modalities, such as the beginning of endodontic therapy, pulpectomy, mechanical or surgical disruption of that infectious environment, or any combination of these (7). Given the lack of efficient circulation in a necrotic pulp system, the efficacy of an oral antibiotic as the first line of treatment for an infection of odontogenic genesis is seriously questioned. In the current study, dental surgeons' prescription patterns for antibiotics were assessed, as well as their attitudes on the rising worry about antibiotic resistance.

Most notably if the source is cured or removed, endodontic infections often have a quick onset and brief persistence. Long-term antibiotic treatments eliminate the commensal flora, eliminating colonisation resistance. Thus, the recommendation of systemic antibiotics needs to be supported. Amoxicillin's broad spectrum of activity, what is needed for endodontic demands, and its careless usage in a healthy person could all contribute to the problem of global antibiotic resistance (8).

In the current study, it was discovered that Clindamycin (38.7%) was the medicine of first choice for patients with penicillin allergies, and that Azithromycin (27.3%) was the antibiotic given to these patients the second most often. Clindamycin was the most commonly prescribed medication for penicillin-allergic patients in the USA (21.6 and 57.03%) (9) and Spain (63.2 and 65.4%), which is in contrast to the findings of the current investigation.

Azithromycin (22%) and clindamycin (19%) were additional medications recommended for patients with penicillin allergies (10)

Because oral streptococci become resistant to macrolides after just one round of treatment, azithromycin plays no part in treating oral infections (11). Despite the fact that clindamycin has a small but significant risk of pseudo membranous colitis, it is an excellent option for those who are allergic to penicillin.

Metronidazole has been found to be ineffective against facultative anaerobic bacteria but very efficient against

obligatory anaerobes. As a result, it needs to be used in combination with other agents. Also, if the patient doesn't improve after 48 hours on penicillin alone, one might think about adding metronidazole to the current medication schedule (12).

Damage to the host response brought on by inadequate therapy duration or antibiotic overdose has led to hazardous consequences (13).

Most odontogenic infections need to be treated for 5 to 7 days on average; however, because of lowered immunity, treatment for severe infections or for patients who are immuno compromised may last longer. When prescribing, it is recommended that the antibiotic persist for 3 days after the patient's symptoms have subsided (14).

In the current survey, 60% of respondents said they would prescribe antibiotics for five days. Effective treatment also heavily depends on patient compliance. Most patients discontinue taking their medications as soon as their early symptoms go away (11).

While recommending a specific brand, brand affordability was taken into consideration as the primary criteria. The prescription may not be filled because the medication is either too expensive or is not covered by a third-party payer.

Generic medication prescriptions might be used as an alternative (8,11). Missed doses after clinical symptoms have ceased are the compliance problem that is most frequently noted.

The unwanted or unexpected side effects that can happen when taking antibiotics present another obstacle to compliance. In each of these scenarios, there is a possibility that altered bacteria will proliferate and have negative effects reversible pulpitis, irreversible pulpitis with moderate to severe preoperative symptoms, acute periodontitis, or any combination of these disorders do not require antibiotic treatment.

Despite these findings, our survey revealed that 78% of participants' prescriptions for antibiotics were based on cost and efficacy.

Antibiotic use is not necessary in cases with necrotic pulp with dentoalveolar abscess, with or without fistula, with no swelling, and no or minor symptoms since nonsurgical root canal therapy can be used as the sole form of treatment.

In the current study, more dentists recommended antibiotics after determining drainage of infection. In situations where an infection is of endodontic origin, the rational administration of antibiotics is based on wellestablished indications (15).

Antibiotics must thus only be taken into consideration as a supplement to traditional root canal therapy or in cases where emergency treatment is not possible (13,16).

This result indicates that the majority of dental surgeons disregarded the scientific evidence for administering antibiotics (17).

#### **Figures & Graphs**

-Assessment of the pattern of Antibiotic Prescription by Dentists : A Questionnaire based study

Details of Participants :-

Age: .....

Gender: .....

State/City: .....

Qualification: .....

Practice Duration :.....

#### Untitled Section:-

- Does your antibiotics prescription depends on patient's preferences ?

   a) Yes.....
  - b) No.....
- 2. Which is the antibiotic of choice for patients with no allergy history ?
  - a) Amoxicillin.....
  - b) Amox+ Clavulanic acid .....
  - c) Azithromycin.....
  - d) Metronidazo1.....
- Do you write the antibiotic Brand name or the Generic name in the prescription ?
  a) Brand name.....
  - b) Generic name.....
- Do you take past dental or medical history of patients beforeprescribing anyantibiotics?
  a) Yes......
  - b) No.....

#### Figure 1: Study Questionnaires

- a) Reversible pulpitis
- b) Irreversible pulpitis
- c) Necrotic pulp without Acute Abscess
- d) Necrotic pulp with Acute Abscess
- 11. Are your prescription of antibiotics influenced by advertisement or marketing?
  - a) Yes.....
  - b) No.....
- 12. How would you prescribe Antibiotics ?
  - Based on, a) Cost
  - b) Efficacy
  - c) Both
- 13. Do you have fear of loss of patients when you do not prescribe antibiotics ?
  - a) Yes.....
  - b) No.....
- 14. What are the etiology/ etiological factors responsible for drug resistance?
  - a) Misuse of antibiotics
  - b) Poor access to quality
  - c) Affordable medicines uses
  - d) Overuse of antibiotics
- 15. How do you keep yourself updated about the latest scientific research prior to the use of antibiotics in dentistry?

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- a) Attending Conferences
- b) Reading journals, blogs, professional news outlets
- c) Talking to your colleagues
- d) Online fellowship programs

#### Figure 2: Study Questionnaires.

- 5. Not prescribing Antibiotics can lead to spread of infection.
  - a) Strongly agree
  - b) Agree
  - c) Disagree
  - d) Strongly disagree
- 6. In which of the diseases would you prescribe prophylactic antibiotics?
  - a) Cardiovascular diseases
  - b) Diabetes mellitus
  - c) Chronic steroid use
  - d) Rheumatoid arthritis
  - e) Cancer chemotherapy
- 7. Which antibiotics do you prescribe for penicillin allergy patients?
  - a) Clindamycin
  - b) Azithromycin
  - c) Metronidazole
  - d) Cephalosporin
- 8. A patient presented with orofacial infection and you prescribed a course of antibiotics and gave an appointment after antibiotics course is completed. The patient returns to you with not much improvement, what will you do in following situation ?
  - a) Again prescribe antibiotics and give an appointment later
  - b) Establish drainage immediately and then prescribe antibiotics
  - c) Establish drainage immediately and give no antibiotics
  - d) Consult with other dentists before starting the treatment
- 9. What is your antibiotic course protocol ?
  - a) Twice Daily for 3 Days .....
  - b) Twice Daily for 5 Days .....
- 10. Is Antibiotics absolutely necessary to manage thefollowingdiseases ?
- 16. Does your antibiotic prescription vary when there is an evidence of Aerobic & Anaerobic infection ? What are the combinations you would prefer ? (write in details)

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Graph 1: Antibiotics prescription depends on patient's

preferences.



Graph 2: The antibiotic Brand name or the Generic name in the prescription.







Graph 4: Prescription of antibiotics influenced by

advertisement or marketing



#### Conclusion

• It is concluded from the present study that the knowledge of scientific basis for the prescription of antibiotics is must for every dentist.

• The current guidelines for antibiotic prescriptions should be strictly followed.

• Antibiotics, when judiciously used, are precisely lifesaving drugs. Professional awareness programs for the dentists regarding antibiotics may prevent misuse & drug resistance.

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Page 246

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