

# Trends of Antibiotics Prescription amongst General Dental Practitioners and Specialist Dental Practitioners in Delhi NCR: A Survey.

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Received: April 2019

Accepted: April 2019

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## ABSTRACT

**Background:** The purpose of this study was to identify and compare the antibiotic prescription trends in the management of endodontic infections between general and specialist dental practitioners in the region of Delhi & NCR. **Methods:** 300 questionnaires were distributed amongst dentists practicing in the region of Delhi, Ghaziabad & Gurgaon. Each questionnaire had 20 questions. Out of 300, only 247 were returned or deemed useful. The data was analyzed using descriptive statistics and chi-square test of significance. **Results:** 83 % of general dental practitioners (GDP) and 69.6% specialist dental practitioners (SDP) prescribe antibiotics for routine endodontic treatment. For patients with no history of drug allergy, the most commonly prescribed antibiotic was amoxicillin and clavulanic acid. In patients with uncertain diagnosis, 15.1% of GDP prescribe antibiotics compared with 13.9% of SDP. In the case of intraoral swelling 91.8% of general dental practitioners chose to prescribe antibiotics compared with 87.3% of specialist dental practitioners (SDP), in the scenario of retreatment, general dental practitioners (54.2%) prescribed antibiotics similar to specialist dental practitioners (53.8%). The average number of days of antibiotic prescription was 5 days. Visits from medical representatives affected the choice of drug prescribed by 35%. **Conclusion:** Dentists tend to overprescribe medication during routine endodontic treatment. GDP overprescribe antibiotics significantly more than SDP for the same.

**Keywords:** Antibiotics, Dental Practitioners.

1

## INTRODUCTION

The term 'antibiosis' was coined by Jean Paul Vuillemin 1877 which was later renamed 'antibiotics' by Selman Waksman, 1942.<sup>[1]</sup> In 1928, Alexander Fleming discovered penicillin, which was made commercially available in 1941. Dentists prescribe medications chiefly for the management of oro-facial infections which are governed by a number of particularities.<sup>[2]</sup> Endodontic infection is one of the commonest reasons for antibiotic prescription amongst dental practitioners.<sup>[3]</sup> The oral cavity contains broad range of microorganisms, both anaerobic and aerobic, but since cultures are not commonly grown from the patient's exudates, the clinician does not know the causative microorganism responsible for the infection thus antibiotic prescription is empirical at best. Dentists contribution to the problem of antibiotic resistance

can be substantial as approximately 10% of all common antibiotics are prescribed by dentists.<sup>[4]</sup> Endodontic infections are polymicrobial involving a combination of gram positive, gram negative, facultative anaerobes and obligate anaerobes.<sup>[5,6]</sup>

Antibiotic use may be associated with unfavourable side effects, ranging from gastrointestinal (GI) disturbances to fatal anaphylactic shock and development of resistant strains. Increasing resistance is related to the overuse or misuse of broad-spectrum antimicrobial agents.<sup>[3]</sup> Hence, there is a clear need for the development of prescribing guidelines and educational initiatives to encourage the rational and appropriate use of antibiotics in dentistry. The aim of this study is to determine antibiotic prescription trends amongst general dental practitioners (GDP) and specialist dental practitioners (SDP) in the region of Delhi, Gurgaon and Ghaziabad.

## MATERIALS & METHODS

A questionnaire survey was designed concerning antibiotic prescription trends among various dentists

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and the variation in use according to different clinical scenarios. 300 questionnaires with 20 questions each was distributed to dentists in Delhi & NCR Region in the year 2017. The questionnaire included aspects about respondents like qualification, years in practice, number of patients being prescribed antibiotics per week and so on. The sampling unit included dental practitioners, both general and specialist dentist with a valid degree and practice experience of greater than one year, practicing in NCR Region. Delhi, Ghaziabad and Gurgaon were selected as the sampling unit to ensure availability of data from a diverse group. Convenience sampling was used to identify the dental practitioners actively engaged in endodontic treatment. Dentists were reminded to return the questionnaires within 10 days. Data was collected, entered on a master chart and analyzed using SPSS analytical software V22.0.0.0. The data was analyzed using descriptive statistics and chi-square test of independence.

**Questionnaire:**

1. Educational Qualification (Specialization if any)-
2. Number of years in practice-
3. Average number of patient's treated in a week-
4. Average number of prescriptions in a week-
5. Category of practice:
  - Full time
  - Part time
  - Academics only
  - Academics and Practice
6. In which of the following situations, would you prescribe antibiotics?

A.	Extra oral& Intraoral swelling
B.	Intraoral swelling
C.	Localized pain
D.	Routine Endodontic Treatment Irreversible Pulpitis Irreversible Pulpitis with Apical Periodontitis Necrotic Pulp Necrotic Pulp with Apical Periodontitis
E.	Interappointment Pain
F.	Post treatment pain after instrumentation & or obturation
G.	Post treatment flare up / Pain
H.	Perforations (before/ after)
I.	Re-treatment
J.	Apicoectomy
K.	Endodontic surgeries
L.	Avulsions
M.	Uncertain Diagnosis

7. Which antibiotic do you prescribe most often for an adult patient with no medical allergies?
  - Amoxicillin: 250mg  500mg
  - Amoxicillin + Clavulanic Acid: 500/125mg  1000mg
  - Clindamycin: 150 mg  300mg
  - Azithromycin: 250mg  500mg
  - Metronidazole: 200 mg  400mg

8. Which antibiotic do you prescribe most often for an adult patient with allergy to penicillin?
  - Clindamycin: 150 mg  300mg
  - Azithromycin: 250mg  500mg
  - Metronidazole: 200 mg  400mg
  - Erythromycin: 250mg  500mg
  - Ornidazole + Ofloxacin: 500mg
  - Other:
9. For how many days do you prescribe antibiotics?
  - <5 days
  - 5 days
  - 7 days
  - 10 days
10. For how many times in a day do you prescribe antibiotics?
  - Once a day
  - Twice a day
  - Three times a day
  - More
11. Do you prescribe antibiotics before seeing the patient's X-ray?
  - Yes  No
12. Do you Prescribe antibiotics over the phone?
  - Yes  No  Sometimes
13. Do you inquire about any previous medication the patient has been taking for the same problem?
  - Yes  No
14. What adjunct therapy do you advise along with antibiotics?
  - Analgesic
  - Antacid
  - Serratiopeptidase
  - Lactobacillus
  - All of the above
15. Do you prescribe for the following situations, if so please specify?
  - Pregnant patient No  Yes  \_\_\_\_\_
  - Cardiac Patient No  Yes  \_\_\_\_\_
  - Diabetic Patient No  Yes  \_\_\_\_\_
16. Do you always take physicians consent for such cases?
  - Yes  No
17. For which of the following special situations, are you likely to prescribe antibiotics?
  - You are going on vacation
  - Patient is going on vacation
  - Upcoming long weekend
  - Patient/ referring dentist solicit it
18. Have you used any new prescriptions or different regimens in the last 12-18 months?
  - Yes  No

19. Do you consider the economic status of the patient while prescribing antibiotics?

Yes  No

20. Does your prescription vary due to the following :

Visits from medical representatives : Yes  No

Free samples provided by companies Yes  No

Availability of medication from local pharmacy

Yes  No

### RESULTS

300 questionnaires with 20 questions each was distributed to dentists in NCR region out of which 247 were returned or deemed useful (n=247). For routine endodontic treatment 83.6% general dental practitioners (GDP) and 69.6% specialist dental practitioners (SDP) were prescribing antibiotics. A significant difference (p-value ≤ 0.05) was seen between the two. In cases of intraoral swelling 91.8% of general dental practitioners (GDP) and 87.3% specialist dental practitioners (SDP) prescribed antibiotics but this was not statistically significant. In cases of retreatment both general dental practitioners (GDP) (54.2%) and specialist dental practitioners (SDP) (53.8%) had similar recommendations, whereas in case of uncertain diagnosis 15.1% general dental practitioners (GDP) and 13.9% of specialist dental practitioners (SDP) advised antibiotics. A greater number of general dental practitioners (GDP) (56.1%) recommended adjunct therapy as compared to specialist dental practitioners (SDP) (54.4%). This included a combination of analgesics, antacids, and lactobacilli. In diabetic/pregnant/cardiac patients, both specialist dental practitioners (SDP) (79.7%/46.8%/74.7%) and general dental practitioners (GDP) (82.2%/61.6%/71.2%) prescribed antibiotics in a comparatively similar manner. A visit from medical representatives affected both general dentists (35.6%) and specialists (29.1%).

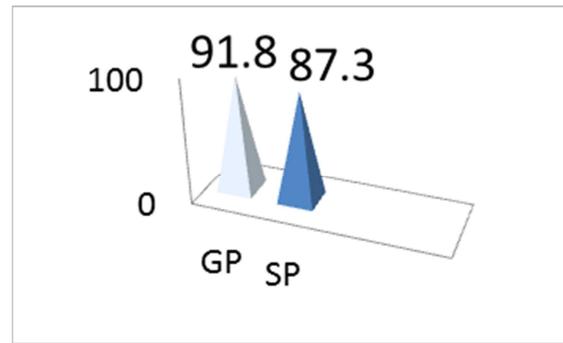
There was no significant difference in respondent's prescription habits in relation to the above except in routine dental procedure prescriptions.

	Value	P-value	GP	SP
Pearson Chi-Square	4.080	0.043*		
No			16.4%	30.4%
Yes			83.6%	69.6%

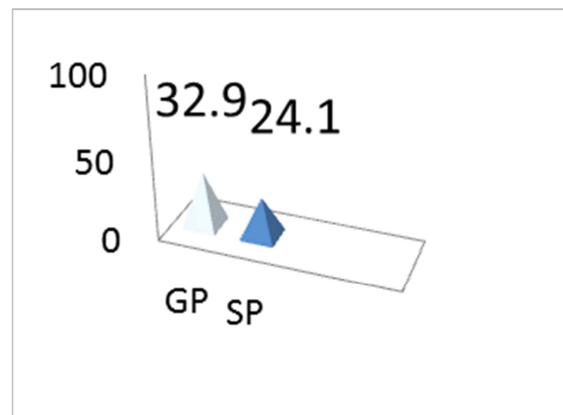
For routine endodontic treatment 83.6% of general dental practitioners (GDP) and 69.6% of specialists (MDS) were prescribing antibiotics.

Significant difference (p-value ≤ 0.05) was seen between general and specialist practitioners

#### Intraoral swelling:



#### Inter appointment Pain



### DISCUSSION

An antibiotic is a chemical substance produced by a microorganism which has the capacity to inhibit the growth of or kill other microorganisms.<sup>[7]</sup> Overuse of these medications promotes natural mutation of common bacteria resulting in newer resistant strains. In most cases of endodontic infection, the blood supply to the tooth is hampered, this would result in an inadequate concentration of the medication to the tooth via the blood stream, thus mechanical debridement still remains the primary treatment modality of endodontic treatment. An infection must be persistent or systemic to justify the need for antibiotic use (i.e, fever, swelling, lymphadenopathy, trismus, or malaise in a healthy patient). According to American Heart Association (AHA) prophylactic use of antibiotics for routine dental procedures is no longer recommended. Today, antibiotics are only recommended for an artificial heart valve or who have had a heart valve repaired with artificial material, a history of endocarditis, and certain congenital heart defects, a heart transplant with abnormal heart valve function.<sup>[8]</sup>

In a study conducted in 2009 it found that more than 60% of the respondents prescribed antibiotics in cases of symptomatic apical periodontitis; majority of the respondents (80%) concluded symptomatic apical periodontitis and periostitis being a clear indication for the prescription of antibiotics. In our study a statistically significant

difference was only seen in prescription trends amongst general dental practitioners (GDP) and specialist dental practitioners (SDP) of which specialists prescribed relatively less antibiotics for routine endodontic procedures. However, no significant difference was seen based on the years of experience of the practitioner. For inter appointment pain, 32.9% general practitioners and 24.1% specialists were prescribing antibiotics. For endodontic conditions like extra & intraoral swelling, 94.5% general practitioners and 94.9% specialists were prescribing antibiotics. Similarly, for intra oral swelling only 91.8% general practitioners and 87.3% specialists were prescribing antibiotics.

In a study for determining attitude of antibiotic prescription during endodontic treatment found over use of antibiotics for acute apical periodontitis in 59% respondents.<sup>[10]</sup> Endodontic conditions like necrotic pulp with acute apical periodontitis, no swelling got 59% antibiotic prescriptions. Similar results were noted in our study, which clearly shows an over-use of antibiotics for this condition. Ideally there is no need of antibiotic prescription in such patients and non-surgical root canal treatment and analgesics should suffice.

Endodontic infections usually last for 2 to 7 days or less, particularly if an infection is treated properly. According to results of this study the average duration of antibiotic prescription was for 5 days. Similarly, Antonio Rodriguez<sup>1</sup> found in his study, the average duration of antibiotic therapy to be  $6.8 \pm 1.8$  days.

In 2013 it was observed that Indian dentists largely prescribed a combination of amoxicillin and metronidazole (30%) in patients with no history of medical allergies.<sup>[11]</sup> Similar results were observed in another study in which it was seen that most of the respondents (73.4%) chose amoxicillin in non-allergic patients [alone (50.5%) or associated with clavulanic acid (22.8%)].<sup>[12]</sup> In our study we found combination of Amoxicillin-clavulanic acid is the most commonly prescribed drug for endodontic infections. In a study conducted in Spain in, the leading antibiotic treatment prescribed in 2007 was amoxicillin plus clavulanic acid, followed by amoxicillin alone.<sup>[13]</sup> The rationale for the choice of amoxicillin could have been its wide spectrum, low incidence of resistance, pharmacokinetic profile, tolerance, and dosage. The choice of antibiotics among practitioners were found to be similar in our study.

According to results of our study and various other surveys conducted in the past it has been noticed that oral healthcare providers in India are overprescribing, which could be a major contributor to the world problem of antimicrobial resistance. There is an urgent need to raise public and professional awareness regarding the risks of antibiotic use.<sup>[5]</sup> The decision to prescribe antibiotics

should not be affected by visit from medical representatives and patient demands. The adoption of protocols for prescribing antibiotics in endodontics could result in considerable financial savings and prevent emergence of resistant strains.

## CONCLUSION

Dentists tend to overprescribe medication during routine endodontic treatment. GDP overprescribe antibiotics significantly more than SDP for the same.

## REFERENCES

- Rodriguez-Núñez A, Cisneros-Cabello R, Velasco-Ortega E, Llamas-Carreras JM, Tórrés-Lagares D, Segura-Egea JJ. Antibiotic use by members of the Spanish Endodontic Society. *Journal of endodontics* 2009;35(9):1198-1203.
- Dar-Odeh N, Ryalat S, Shayyab M, Abu-Hammad O. Analysis of clinical records of dental patients attending Jordan University Hospital: documentation of drug prescriptions and local anesthetic injections. *Therapeutics and clinical risk management* 2008;4(5):1111.
- Oberoi SS, Dhingra C, Sharma G, Sardana D. Antibiotics in dental practice: how justified are we. *International dental journal* 2015;65(1):4-10.
- Pallasch TJ. Global antibiotic resistance and its impact on the dental community. *J Cal Dent Assoc* 2000;28:215-33.
- Siqueira JF Jr, Rocas IN. Exploiting molecular methods to explore endodontic infections: part 2—redefining the endodontic microbiota. *J Endod* 2004;31:488-96.
- Siqueira JF Jr, Rocas IN, Silva MG. Prevalence and clonal analysis of *Porphyromonas gingivalis* in primary endodontic infections. *J Endod* 2008;34:1332-6.
- Dorland WAN. *Dorland's Illustrated Medical Dictionary*. Saunders; 2007.
- Walton R, Zerr M, Peterson L. Antibiotics in dentistry--a boon or bane. *APUA Newsletter* 1997;15(1):1-5.
- Skukaite N, Peculiene V, Maneliene R, Maciulskiene V. Antibiotic prescription for the treatment of endodontic pathology: a survey among Lithuanian dentists. *Medicina* 2010;46(12):806-13.
- Iqbal A. The Attitudes of Dentists Towards the Prescription of Antibiotics During Endodontic Treatment in North of Saudi Arabia. *Journal of clinical and diagnostic research : JCDR* 2015;9(5):Zc82-84.
- Kumar KP, Kaushik M, Kumar PU, Reddy MS, Prashar N. Antibiotic prescribing habits of dental surgeons in hyderabad city, India, for pulpal and periapical pathologies: a survey. *Advances in pharmacological sciences* 2013;2013:537385.
- Garg AK, Agrawal N, Tewari RK, Kumar A, Chandra A. Antibiotic prescription pattern among Indian oral healthcare providers: a cross-sectional survey. *The Journal of antimicrobial chemotherapy* 2014;69(2):526-528.
- Llor C, Cots JM, Gaspar MJ, et al. Antibiotic prescribing over the last 16 years: fewer antibiotics but the spectrum is broadening. *Eur J Clin Microbiol Infect Dis*, 2009, vol. 28 (pg. 893-7).

**How to cite this article:** Shafia, Khurana K, Bhalla S, Sharma N. Trends of Antibiotics Prescription amongst General Dental Practitioners and Specialist Dental Practitioners in Delhi NCR: A Survey. *Ann. Int. Med. Den. Res.* 2019; 5(3):DE13-DE16.

**Source of Support:** Nil, **Conflict of Interest:** None declared