

# A Questionnaire Based Survey on the Antibiotic Prescription Pattern of Dentists in Eastern Part of India

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## ABSTRACT

**Introduction:** Recent surveys reported that dentists in several countries have restricted knowledge about prescribing antibiotics. The aim of this study was to investigate the knowledge and attitude of a group of dentists in Jharkhand towards antibiotic prescription.

**Material and Methods:** The present study was conducted amongst a group of dentists in Jharkhand, a state in eastern part of India. A questionnaire was mailed to 150 dentists out of which 131 responded back. The questionnaire included questions about the knowledge and attitudes of dentists toward prescribing antibiotics to dental patients.

**Results:** Amoxicillin and amoxicillin-clavulanic acid were the most popular antibiotics. More than 66% of the sample prescribed antibiotics daily.

**Conclusion:** There is a need to improve awareness of dentists regarding antibiotic prescribing to patients particularly in the aspects of type of antibiotic and its clinical indications.

**Keywords:** Odontogenic Infections, Antibiotic, Dentists, Endodontic, Extractions

## INTRODUCTION

Odontogenic infections are commonly encountered by dentists for which antibiotics are frequently prescribed. Although a boon, antibiotics can be called as a double-edged sword as its injudicious usage might cause complications. Although considered as an adjunct to definitive treatment, antibiotics are usually prescribed for shorter periods by dentists as a substitute for the definitive treatment.<sup>1</sup>

Due to increased awareness of antibiotic resistance, there has been a lot of questions on the scope of antibiotic prophylaxis use in dentistry. Antibiotic resistance during dental therapy is substantial, because dentists prescribe approximately 10% of all common antibiotics.<sup>2</sup>

Health organizations have increased emphasis on the appropriate use of antibiotics. A survey conducted among general dental practitioners in 2004 revealed that 15% of the dentists in United Kingdom prescribe antibiotics on a daily basis and 40% of the dentists on at least three occasions per week.<sup>3-5</sup>

Numerous studies have been conducted all around the world regarding antibiotic prescription patterns. However, little information is available concerning these practices among dentists of the Eastern part of India. Hence, the aim of this study was to determine antibiotic prescription practices of dental practitioners in Jharkhand and their adherence to professional guidelines while treating oral health problems.

## MATERIAL AND METHODS

The present cross-sectional survey was conducted to determine the antibiotic prescribing practices among dentists in Jharkhand. A total of 150 dentists, actively engaged in treatment of dental patients in different public and private hospitals were invited to participate in this study. A self-administered questionnaire to explore general information and questions related to antibiotics use in certain dental clinical procedures was provided to the dentists. The questions were mainly close ended, with few open questions to allow free response. The questionnaires were mailed to the dentists. Dentists were given 3 reminders at a week's gap and the completed questionnaire was retrieved. 131 of the 150 dentists responded to the questionnaire.

Apart from the demographic details, a questionnaire with multiple choices in pertinence to antibiotic regimen was formulated:

- How often do you write prescriptions for antibiotics for dental infections?
  - Daily
  - Weekly
  - Monthly
  - Hardly ever
- What is the most common antibiotic prescribed by you?
  - Penicillin
  - Amoxicillin
  - Clindamycin
  - Cephalexin
  - Amoxicillin-clavulanic acid
- What is the most common route of antibiotic administration?
  - Oral
  - Intravenous

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4. Do you receive emergency calls?
  - a Yes
  - b No
5. Would you prescribe antibiotic for reversible pulpitis?
  - a Yes
  - b No
6. Would you prescribe antibiotics prior to extraction?
  - a Yes
  - b No
7. Would you prescribe antibiotics for pain?
  - a Yes
  - b No
8. The average number of days you usually prescribe antibiotic for children?
  - a 2 days
  - b 3 days
  - c 5 days
  - d 7 days
9. Do you take medical history of the patient before prescribing antibiotics
  - a Yes
  - b No
10. Do you prescribe antibiotics to pediatric patients
  - a Yes
  - b No

version 20 (SPSS Inc., Chicago, IL, USA) database and analyzed using cross-section descriptive statistics. Chi square test was used to assess the significance in the difference in the proportion of responses with  $p \leq 0.05$  was considered statistically significant.

## RESULTS

A total of 10 pretested closed ended questions were compiled and were mailed to 150 dental clinics out of which only 131 responded. A total of 77 undergraduate dental practitioners and 54 postgraduate specialists volunteered to contribute to this survey. The questionnaires with less than 90% completed answers were excluded from the study. Of the 77 undergraduate general dentists, 36 doctors were having less than 10 years of clinical experience out of which 30 were male and 6 were female. 31 undergraduate male dentists and 10 female undergraduate dentists with more than 10 years of experience participated in the study. In the specialists' group, 15 males and 10 females with less than 10 years of experience and 21 males and 8 females with more than 10 years of experience completed the survey (Table 1).

The mean of prescribing antibiotic therapy was  $4 \pm 0.23$  days for adults and for children the antibiotic treatment was  $4 \pm 0.84$  days.

In terms of the age of the dentists, the study population was categorized into three age groups of 25–30, 31–45 and over 46 years of age (Table 2).

The breakdown of the 54 postgraduate dental specialists is

## STATISTICAL ANALYSIS

The data were numerically coded and entered into SPSS

	Undergraduate n=77		Postgraduate n=54		p	OR
	Male	Female	Male	Female		
>10 Years Experience	30	06	15	10	0.12	0.062
<10 Years Experience	31	10	21	08		
Total n=131						

**Table-1:** Information of the participants/dental professionals

S No	Age (Years)	N(131)	p	OR (Odds Ratio)
1	25-30	45	0.32 (NS)	0.16
2	31-45	57		
3	$\geq 46$	29		

(NS-Statistically non significant)

**Table-2:** Age of the participants

S No	Speciality	n
1	Periodontics	14
2	Oral Surgery	12
3	Orthodontics	05
4	Conservative Dentistry and Endodontics	06
5	Prosthodontics	11
6	Pedodontics	02
7	Oral Pathology	02
8	Oral Medicine	01
9	Public Health Dentistry	01
		54

**Table-3:** Specialities of the postgraduate dentists

S No	Ques	Choices	UG Response	(%)	PG Response	(%)	p
1	Ques no 1	a)	45	50.44%	25	46.29%	0.022 (Significant)
		b)	12	15.58%	22	40.74%	
		c)	15	19.48%	5	9.25%	
		d)	5	6.49%	2	3.70%	
2	Ques no 2	a)	10	12.98%	2	3.70%	0.037 (Significant)
		b)	20	25.97%	8	14.81%	
		c)	2	2.59%	2	3.70%	
		d)	5	6.49%	15	27.77%	
		e)	40	51.94%	27	50.00%	
3	Ques no 3	a)	77	100.0%	54	100.0%	0.063
		b)	0	0.00%	0	0.00%	
4	Ques no 4	a)	75	97.40%	50	92.59%	0.12
		b)	2	2.59%	4	7.40%	
5	Ques no 5	a)	60	77.92%	35	64.81%	0.062
		b)	17	22.07%	19	35.19%	
6	Ques no 6	a)	77	100.0%	42	77.77%	0.047 (Significant)
		b)	0	0.00%	12	22.22%	
7	Ques no 7	a)	12	15.58%	12	22.22%	0.066
		b)	65	84.41%	42	77.77%	
8	Ques no 8	a)	5	6.49%	2	3.70%	0.031 (Significant)
		b)	15	19.48%	22	40.74%	
		c)	45	58.44%	25	46.29%	
		d)	12	15.58%	5	9.25%	
9	Ques no 9	a)	60	77.72%	50	92.50%	0.012 (Significant)
		b)	17	22.07%	4	7.40%	
10	Ques no 10	a)	75	97.40%	50	92.50%	0.071
		b)	2	2.50%	4	7.40%	

Table-4: Responses to questions 1-10

given in (Table 3)

Response to questions are mentioned in table 4

Within the limitations of the present study the descriptive statistics was used for representing each category of response and kappa statistics was used to assess the reliability of the initial cohort. Kappa statistic was found to be 0.82 and the same questionnaire was used in the main study (initial cohort participants were not included). Chi square test which was used to assess the significance in the difference in the proportion of responses revealed that with  $p \leq 0.05$  being statistically significant, statistically significant differences were observed in questions 1,2,6,8 and 9 among UG and PG practitioners which means there is need of awareness and knowledge deficits regarding proper and standardized use of antibiotic regimen.

## DISCUSSION

Under the limitations of the present study it was observed that most of the dentists (almost 50%) prescribed antibiotics daily while less than 6% of the participants hardly ever prescribed antibiotics. Amoxicillin and clauvanic acid was the antibiotic of choice for majority of doctors with almost half of the 131 respondents making them the choice of drugs. According to BMJ group and the Royal Pharmaceutical Society of Great Britain<sup>6</sup> amoxicillin-clavulanic acid can be used. They also stated that 29.7% doctors prescribe combination antibiotics like amoxicillin/clavulanic acid

combined with metronizadole. Paterson SA<sup>7</sup> and Palmer NO<sup>8</sup> observed that amoxicillin was effective in the treatment of pediatric infections. Combined drug prescription in dental practice is becoming more important as now a days the doctor encounters resistant or mixed infections.<sup>9</sup>

Gowri S et al<sup>10</sup> observed that the most commonly prescribed antibiotic in Uttar Pradesh, India is amoxicillin which is in agreement with our findings. Dar-Odeh NS et al<sup>11</sup> did a survey in Jordan and concluded that dentists prescribe unnecessary antibiotics in irrelevant clinical conditions as an alternative to sterilization or to delay treatment which might be one of the reason for prolonged usage of antibiotics in our study as well. Llor C et al<sup>12</sup> stated that in Spain, amoxicillin plus clavulanic acid is the leading antibiotic. Amoxicillin is also the principal antibiotic prescribed in dental clinics in other European countries as observed by Tulip DE et al.<sup>13</sup>

In USA amoxicillin was prescribed only by 27.5% of members while 18.7% members prescribed ofloxacin+ornidazole.<sup>14,15</sup> In contrast to the previous studies, metronidazole and clindamycin were the other most prescribed drugs in non-penicillin-allergic patients.<sup>16,17</sup>

In this survey, almost 50% of practitioners prescribed antibiotics daily, similar to the finding of Segura-Egea et al.<sup>17</sup> and higher than what was observed by Rodriguez- Nuñez et al.<sup>16</sup> Surveys conducted in the USA higher percentages have been reported<sup>14,15</sup>.

In the current study, more than 75% of the participants

prescribe antibiotics following extractions. The number was 100% in undergraduate respondents. This is because of the fact that antibiotics are helpful in preventing further infection.<sup>18</sup> But antibiotics should be prescribed only if there are signs of systemic spread of infection.<sup>19</sup>

Studies have also suggested that antibiotic prescription by postgraduate dentists is much lesser when compared to that of undergraduate doctors due to better understanding of the disease conditions and superior diagnostic and treatment skills.<sup>18</sup>

Duration of antibiotic course showed the difference in various studies. A short course of antibiotic usage for 2-3 days is advisable in children.<sup>1</sup> Usage of sub therapeutic dosage for long duration can lead to the development of mutant strains.<sup>18</sup> In addition, this can result in the destruction of normal flora in the gut and oral cavity.<sup>20</sup>

More than 60% of the respondents prescribed antibiotics for endodontic pain in our study. Baumgartner JC<sup>21</sup> stated that a majority of infections of endodontic origin could be managed without antibiotics.<sup>21-23</sup>

Conflicting results from other studies might be attributed to differences in demography and the lack of understanding of the rationale of usage of antibiotics and anti-inflammatory.

## CONCLUSION

Under the limitations of the present study it can be concluded that most of the dentists participating in the survey prescribed antibiotics daily. Although the low number of participants is a limitation of the study but the results of this study provide a vista about the attitude and knowledge of dentists on antibiotic prescribing. It was also observed that there was no consensus among participants regarding the important aspects of antibiotic prescribing like dose, frequency and duration. It should also be kept in mind that the most common encountered problem in a dental clinic is pain. The cause of the pain may or may not be an infection. If the cause of pain is not an infection, there is no point in prescribing antibiotics. Antibiotics may be used as an adjunct in the treatment.

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