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STUDY OF INDIAN DENTIST KNOWLEDGE AND IMPLEMENTATION OF CURRENT GUIDELINES FOR ANTIBIOTIC PROPHYLAXIS OF INFECTIVE ENDOCARDITIS IN PATIENTS WITH PREDISPOSING CARDIAC CONDITIONS

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ABSTRACT
Infective endocarditis (IE) is a rare (< 7 cases per 100,000 persons per year) and severe disease (20% early mortality, 40% at 5 years) (1,2,3). Infective endocarditis is caused by infected vegetation which often occurs on previously damaged or con- genitally malformed cardiac valves or endocardium (heart lining). A questionnaire containing 15-20 questions were prepared and distributed among the Indian dentists. Indian dentist knowledge and implementation of current guidelines for antibiotic prophylaxis of infective endocarditis in patients with predisposing cardiac conditions was assessed and corresponding results were calculated and tabulated. This study revealed relevant areas to improve the training of dentists, such as knowledge of some cardiac conditions, the potential side effects of the antibiotics used, and the pathogenesis of infective endocarditis. Consequently, dentists' knowledge can be improved by conducting CDE and keeping up with the latest journal.
Keywords: Antibiotics, Indian dentist, Infective Endocarditis

INTRODUCTION
Infective endocarditis (IE) is a rare (< 7 cases per 100,000 persons per year) and severe disease (20% early mortality, 40% at 5 years) (1–3). Infective endocarditis is caused by infected vegetation which often occurs on previously damaged or con- genitally malformed cardiac valves or endocardium (heart lining).

The contaminating life forms are normally microbes, however less usually are parasites, especially of the Candida species, which may enter the blood by means of various entryways (4,5). Bacterial endocarditis (BE) is infective endocarditis caused by microbes which enter the blood (bacteremia). Microorganisms may enter the blood through an assortment of entrances, particularly mucosal surfaces. The gingiva and periodontal tendon which encompasses all teeth is always a level of irritation and all things considered a potential purpose of section for microscopic organisms inside the blood. For sure, it has been exhibited that regular exercises, for example, tooth-brushing cause bacteremia (6). The incidence of BE is low, and the proportion of cases arising as a result of dental therapy is controversial, with various estimates from 4% to 64% of BE cases arising as a result of dental treatment (7,8). Although dental procedures are frequently implicated in the development of endocarditis, only 4% to 7.5 percent of cases have such a temporal relationship.

Most dental procedures cause bacteremia and it was believed that this may lead to BE. There has been a well-established practice of administering antibiotics to patients who are at risk of developing BE prior to procedures during which a bacteremia may develop and guidelines were published recommending this practice (9). The reasoning behind this is that a large circulating dose of antibiotic will limit the growth of infected vegetation on damaged endocardium, hence preventing endocarditis. However, since this review was first published, both the UK and the USA have issued updated guidelines which saw a radical sea-change moving away from giving antibiotics to all at-risk patients to only advising antibiotics are given to high risk patients (10). Our team has extensive knowledge and research experience that has translated into high quality publications(11–30).

MATERIALS & METHODS

A cross-sectional questionnaire survey was conducted among Indian Dentists in India during January 2020. A total of 102 Indian dentists were assessed using a structured questionnaire comprising of 15-20 closed-ended questions regarding the participants' demographic details (age, gender, and place) Knowledge and implementation of current guidelines for antibiotic prophylaxis of infective endocarditis inpatients with predisposing cardiac conditions. Questions were explained whenever necessary with assurances on confidentiality of their identities and were requested to mark their answers and complete it individually.

RESULTS

A total of 102 Indian dentists responded to the survey, the number of males were 55(53.9%) while 47(46.1%) were females (Table 1). Out of which 17.6 % were Undergraduate and the remaining were Post graduates. (Table 2). Out of the 102 dentists 72 (69.6%) worked at academic level, while 31 did private practice (Table 3).

Table 4 shows that 52% of the Indian dentists came across infective endocarditis patients while 48% haven't come across any Infective endocarditis patients, 92% of the Indian dentists would recommend antibiotics as prophylaxis for patients undergoing dental treatment (Table 5).

Table 6 shows 85% of the dentists recommend antibiotic prophylaxis for patients undergoing procedures related to gingiva while 15% would not recommend. Table 7 shows 73.5% wouldn't recommend antibiotic prophylaxis for patients undergoing prosthetic replacement of teeth.

However, (92.2%) of the Indian dentist agree to antibiotic prophylaxis being given as a prophylaxis to patients undergoing treatment involving dental implants (Table 8).

When asked if chlorhexidine mouthwash should be offered as prophylaxis for infective-endocarditis to people at the risk of endocarditis who are having dental procedure 71.6% answered as yes while 28.4% answered as no (Table 9).

Majority of the Indian dentists would recommend antibiotic prophylaxis for patients undergoing dental extractions (Table 10), 91.2% of the Indian dentists would recommend antibiotic prophylaxis for patients undergoing treatments such as incision drainage. (Table 11).

94.3% Of the Indian dentist would recommend antibiotic prophylaxis for treatment that would be done beyond the tooth apex while (Table 12).

93.1% of the Indian dentists would recommend antibiotic prophylaxis against infective endocarditis for patients undergoing dental extraction with Prosthetic material used for cardiac valve repair, such as amyloplast rings and cord. (Table 13).

56.9% of the dentists would recommend antibiotics as prophylaxis for the patients that were undergoing RCT (Table 14).

86.3% of the dentists would recommend antibiotic prophylaxis against infective endocarditis for patients with completely repaired congenital heart defects with prosthetic material or device, whether placed by surgery or catheter intervention, during the first six months after the procedure.
Table 16 shows that 69.6% of the dentists would recommend 2g of amoxicillin as the dose as antibiotic prophylaxis for patients undergoing dental procedure while 25% suggested 1g as the recommended dosage.
In children the majority of the 51% of the dentist recommended 50g as the dosage to be given (Table 17).

DISCUSSION

In the present study more than 50% of the Indian dentist have come across Infective endocarditis patients and 92% of them are aware that antibiotic can be used as a prophylaxis prophylaxis of Infective Endocarditis in patients with predisposing cardiac conditions.
The knowledge regarding if antibiotic prophylaxis should be administered for patients undergoing prosthetic replacement of teeth not high, 73.5% of the dentists were certain that there was no need for antibiotic prophylaxis while 26.5% would recommend antibiotic prophylaxis. However, the majority of the dentist 92% had adequate knowledge on antibiotic prophylaxis being recommended for patients undergoing treatment like implants.
This study showed that 85% of the Indian dentists would recommend antibiotic prophylaxis for patients undergoing treatment related to the gingiva. More than 90% of the Indian dentists would recommend antibiotic prophylaxis for patients undergoing dental treatment such as dental extraction, periodontal procedure, incision drainage etc.
When asked if chlorhexidine mouthwash should be offered as prophylaxis for infective-endocarditis to people at the risk of endocarditis who are having dental procedure 71.6% answered as yes while 28.4% answered as no. Around 30% of the dentists weren't aware that routine use of 0.2% of chlorhexidine mouthwash before treatment like dental extraction could reduce the risk of post-extraction bacteremia (31,32).
The recommended dosage of amoxicillin was 2g 1our before treatment, 69.6% of the Indian dentists were certain about the recommended dosage while 30.4% of the remaining dentists weren't aware of the dose. In children the recommended dosage was 50g, 51% of the dentists were aware of the dosage while 49% of the remaining dentist wasn't aware.
Future medicines for IE will underline pragmatism. For instance, a successful treatment system for left-sided IE that evades long haul venous access would be a significant development. Something like two randomized clinical preliminaries are trying the viability and wellbeing of supplanting part of the standard intravenous antibiotic course with a progression down procedure to oral antibiotic (33).
Dalbavancin and oritavancin, lipoglycopeptide-class antibiotic agents that were endorsed in 2014 by the Food and Drug Agency for the treatment of intense bacterial skin and skin structure contaminations (ABSSSI), address likely enhancements to our flow choices of intravenous treatment for IE. A significant property is their amazingly long half-life, assessed to be from 10-14 days (34).
Treatments not needing expanded intravenous access, for example, dalbavancin or oritavancin, could be particularly beneficial in treating IE in patients with IDU or who have restricted choices for intravascular line position.
The most effective way to treat IE is to prevent it. Although most approaches to date on IE counteraction have zeroed in on disease control and dental prophylaxis, extensive assets have likewise been put resources into immunization advancement focusing on normal bacterial reasons for IE.

Achievement has been blended and none of these specialists is as of now commercially accessible. In any case, future avoidance procedures for certain purposes of IE are probably going to incorporate immunizations.

APPENDIX

Table 1: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	55	53.9	53.9	53.9
	Female	47	46.1	46.1	100.0
	Total	102	100.0	100.0	

Table 2: Professional Qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	UG	18	17.6	17.6	17.6
	PG	84	82.4	82.4	100.0
	Total	102	100.0	100.0	

Table 3: Place of Work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Academic	71	69.6	69.6	69.6
	Private Practice	21	20.6	20.6	90.2
	Hospital based Practice	10	9.8	9.8	100.0
	Total	102	100.0	100.0	

Table 4: Have you come across any Infective Endocarditis patients

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	53	52.0	52.0	52.0
	No	49	48.0	48.0	100.0
	Total	102	100.0	100.0	

Table 5: Is antibiotic prophylaxis recommended for patients undergoing dental procedure?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	92	90.2	90.2	90.2
	No	10	9.8	9.8	100.0
	Total	102	100.0	100.0	

Table 6: Is antibiotic prophylaxis recommended for patients undergoing a procedure related to gingiva?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	85	83.3	83.3	83.3
	No	17	16.7	16.7	100.0
	Total	102	100.0	100.0	

Table 7: Is antibiotic prophylaxis recommended for patient undergoing prosthetic replacement of teeth?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	27	26.5	26.5	26.5
	No	75	73.5	73.5	100.0
	Total	102	100.0	100.0	

Table 8: Is antibiotic prophylaxis recommended for patients undergoing dental implant?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	94	92.2	92.2	92.2
	No	8	7.8	7.8	100.0
	Total	102	100.0	100.0	

Table 9: Should chlorhexidine mouthwash be offered as prophylaxis for infective carditis to people at the risk of endocarditis who are having dental procedure?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	73	71.6	71.6	71.6
	No	29	28.4	28.4	100.0
	Total	102	100.0	100.0	

Table 10: For Which of the following procedures would you suggest antibiotic prophylaxis for preventing infective endocarditis?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Dental extraction	89	87.3	87.3	87.3
	Periodontal procedure	10	9.8	9.8	97.1
	None of the above	3	2.9	2.9	100.0
	Total	102	100.0	100.0	

Table 11: Is antibiotic prophylaxis recommended for patients undergoing incision and drainage or other procedure involving infected tissue in the oral cavity?

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Yes	93	91.2	91.2	91.2
	No	9	8.8	8.8	100.0
	Total	102	100.0	100.0	

Table 12: Do you recommend antibiotic prophylaxis against infective endocarditis for patients undergoing oral surgery beyond the apex?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	96	94.1	94.1	94.1
	No	6	5.9	5.9	100.0
	Total	102	100.0	100.0	

Table 13: Do you recommend antibiotic prophylaxis against infective endocarditis for patients undergoing dental extraction with Prosthetic material used for cardiac valve repair, such as amyloplastic rings and chord?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	95	93.1	93.1	93.1
	No	7	6.9	6.9	100.0
	Total	102	100.0	100.0	

Table 14: Do you recommend antibiotic prophylaxis against infective endocarditis for patients who are undergoing RCT?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	58	56.9	56.9	56.9
	No	44	43.1	43.1	100.0
	Total	102	100.0	100.0	

Table 15: Do you recommend antibiotic prophylaxis against infective endocarditis for patients with completely repaired congenital heart defects with prosthetic material or device, whether placed by surgery or catheter intervention, during the first six months after the procedure?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	88	86.3	86.3	86.3
	No	14	13.7	13.7	100.0
	Total	102	100.0	100.0	

Table 16: What is the recommended oral dose of amoxicillin for patients with infective endocarditis in adults undergoing dental procedure? (g)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	26	25.5	25.5	25.5
	2	71	69.6	69.6	95.1
	3	4	3.9	3.9	99.0
	5	1	1.0	1.0	100.0
	Total	102	100.0	100.0	

Table 17: What is the recommended oral dose of amoxicillin with infective endocarditis in children undergoing dental procedure? (mg)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20	10	9.8	9.8	9.8
	25	38	37.3	37.3	47.1
	35	2	2.0	2.0	49.0
	50	52	51.0	51.0	100.0
	Total	102	100.0	100.0	

Table 18: What can be used as an alternative for patients allergic to penicillin?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	All of the above	29	28.4	28.4	28.4

Azithromycin	4	3.9	3.9	32.4
Cephalexin	16	15.7	15.7	48.0
Clindamycin	53	52.0	52.0	100.0
Total	102	100.0	100.0	

QUESTIONNAIRE

Name	
Professional qualification.	● UG ● PG
Have you come across any Infective carditis patients?	● YES ● NO
Is antibiotic prophylaxis against infective carditis recommended for patients undergoing dental procedure?	● YES ● NO
Is antibiotic prophylaxis against infective carditis recommended for patients undergoing procedures related to gingiva?	● YES ● NO
Is antibiotic prophylaxis against infective carditis recommended for patients undergoing prosthetic replacement of teeth?	● YES ● NO
Is antibiotic prophylaxis against infective carditis recommended for patients undergoing dental implants?	● YES ● NO
Should chlorhexidine mouthwash be offered as prophylaxis for infective carditis to people at the risk of endocarditis who are having dental procedure?	● YES ● NO
For Which of the following procedure you would suggest antibiotic prophylaxis for preventing infective endocarditis	● Dental extraction ● Orthodontic bracket ● Periodontal Procedure ● None of the above
Is antibiotic prophylaxis recommended for patients undergoing incision and drainage or other procedure involving infected tissue in the oral cavity?	● YES ● NO

Do you recommend antibiotic prophylaxis against infective endocarditis for patient undergoing oral surgery beyond the apex?	• YES • NO
Do you recommend antibiotic prophylaxis against infective endocarditis for patients undergoing dental extraction with Prosthetic material used for cardiac valve repair, such as annuloplasty rings and cord?	• YES • NO
Do you recommend antibiotic prophylaxis against infective endocarditis for patients who are undergoing RCT?	• YES • NO
Do you recommend antibiotic prophylaxis against infective endocarditis for patients with Completely repaired congenital heart defect with prosthetic material or device, whether placed by surgery or catheter intervention, during the first six months after the procedure?	• 1g • 2g • 3g • 5g
What is the recommended oral dose of amoxicillin with infective endocarditis in children undergoing dental procedure	• 50 mg • 25mg • 35 mg • 20 mg
What can be used as an alternative for patients allergic to penicillin?	• Clindamycin • Cephalexin • Azithromycin • All of the

CONCLUSION

This study revealed relevant areas to improve the training of dentists, such as knowledge of some cardiac conditions, the potential side effects of the antibiotics used, and the pathogenesis of infective endocarditis. Consequently, dentists' knowledge can be improved by conducting CDE and keeping up with the latest journal.

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