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Current Paradigms in Antibiotic Prescribing for Dental Implant Procedures: Insights from a Questionnaire-Based Study

[1]Munjavarapu Phebe Niriha, [2]Dr. Damera Trinath Kishore, [3]Dr Sandhya Pavankumar, [4]Dr Tejaswi Kodem, [5]Dr Anusha Boddeda,

[1]Post Graduate, Gitam Dental College And Hospital, Visakhapatnam Andhra Pradesh, India

[2]Head And Professor, Gitam Dental College And Hospital, Visakhapatnam Andhra Pradesh, India

[3]Professor, Gitam Dental College And Hospital, Visakhapatnam Andhra Pradesh, India

[4]Assistant Professor, Gitam Dental College And Hospital, Visakhapatnam Andhra Pradesh, India

[5]Associate Professor, Gitam Dental College And Hospital, Visakhapatnam Andhra Pradesh, India

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KEYWORDS

Antibiotic prescription, Implant dentistry, Postoperative, Preoperative, Prophylaxis, Questionnaire study.

ABSTRACT:

Introduction:

The use of antibiotics in implant dentistry is still debatable, despite the fact that several preoperative and/or postoperative systemic antibiotic regimens have been proposed to reduce failure following dental implant implantation and postoperative infection..

Objectives:

To ascertain the current antibiotic prescribing practices of medical professionals in relation

to dental implant placement and to determine whether ashared understanding has been

developed between professionals who do implant surgery.

Methods: A questionnaire was sent to all the dentists practising implantology in India. The research concerned whether routine pre- or postoperative antibiotic prescriptions were given in connection with the implantation of dental implants. The descriptive and chi-square analyses were used to compare the categorical data.

The Kruskal-Wallis test was used to compare the quantitative data by category.

The significance level was taken as $p < 0.05$.

Results: A total of 384 members responded to the questionnaire. most often prescribed antibiotics for dental implant placement was amoxicillin combined with clavulanic acid. Antibiotic were mostly prescribed for advanced surgical procedures, immediate implant therapy, single-stage implant placement, and medically compromised patients both before and after surgery. chlorhexidine was their preferred mouthrinse.

Conclusions: This study recommends developing recommendations for periodontology specific antibiotic prescription as well as improving the understanding of dental surgeons performing dental implantology about antibiotic prescribing.

1. Introduction

Dento-maxillofacial structure preservation and/or restoration is the primary goal of dentistry. One of the primary responsibilities of dentists is to assist patients with missing teeth. Dental implants are now the most promising standard method that has high success and survival rates for replacing a lost or badly prognosed tooth [1]. Given that implant placement is a common surgical procedure in dentistry offices, it's important to know the variables influencing the longevity and success

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of implants. The survival and success of implants are influenced by numerous factors. First and foremost, early and late implant site infection are among these risks [2]. Given that dental implant treatment is currently a common surgical procedure, it's important to learn how antibiotics affect the outcome of such a frequently performed procedure.

Oral microflora should be managed after dental implant placement because pathogenic bacteria found in the oral environment can lead to peri-implant infections in both implants and teeth, which can hinder the early osseointegration the healing process of the implant of the implant [3]. Unfortunately, there are currently conflicting findings about the use of antibiotics during surgery, and bias exists in many of the available clinical data [4]. To avoid postoperative infection and subsequent early implant loss, numerous pre- and postoperative antibiotic regimes have been suggested. Adell et al. suggested taking 2 g of penicillin-V (phenoxymethylpenicillin) orally one hour prior to the procedure and continuing twice daily for 10 days following [5]. Several systematic reviews, recommended to take 500 mg of penicillin-V four times a day throughout the recuperation period, and to take 2 milligrams of the antibiotic oral one hour before the procedure [6, 7]. Meta-analysis by Braun et al. indicated that preoperative antibiotic treatment may prevent postoperative infection after evaluating the clinical trials in the literature; however, the heterogeneity of the research suggests that the information in the literature cannot be a complete result. (with eight RCTs included). They claimed that the present scientific evidence does not explain postoperative or pre- and postoperative antibiotic use [8].

Clinicians should always keep in mind that using antibiotics excessively to reduce implant failures may have unintended consequences. It should not be assumed that a patient's use of antibiotics has anything to do with the success or survival of their dental implants. Inappropriate use of antibiotics has an impact on the person as well as society. Antibiotic-induced hypersensitivity reactions can result in life-threatening health issues [9]. Furthermore, a significant number of people may experience gastrointestinal adverse effects from the usage of some antibiotics due to opportunistic infections.

Healthcare professionals should consider all the implications before writing an antibiotic prescription. Antibiotic prophylaxis has not been shown to be beneficial in simple cases but in complex cases, such as grafting procedures, the immediate placement of implants, and/or patients with systemic comorbidities proved beneficial [10]. Preoperative antibiotic administration may lower the chance of implant failure, according to another comprehensive review by Lund et al. [11]. However, a subanalysis of the original data revealed that preoperative antibiotics are not necessary in healthy patients before straightforward implant operations. Nonetheless, the lack of a conclusion in the literature about the use of antibiotics before and/or after implant surgery indicates that physicians do not have access to all the scientific information they need to make informed clinical decisions.

2. Objectives

The aim of this questionnaire-based study was to investigate the prescribing practices of dentists working in South India in relation to dental implant treatments.

3. Methods

An cross-sectional, observational study was conducted in South India using a pre-tested and pre-validated questionnaire among the clinicians dealing with dental implant. (The study design was reviewed and approved by the Institutional Ethical Committee – not yet)

The sample size was calculated based on the findings of the pilot study, considering a 95% confidence level, a 3% margi of error, and 63.5% of awareness. Upon this, sample sizes were calculated as 384 participants. Using Google Forms, an online self-reported questionnaire with settings that is, only one response and option was designed. The link to the questionnaire was sent through e-mails and WhatsApp of the investigator, as it requires much less time and effort and supports cost minimization. It was left up to each individual to choose to participate in the survey

An electronic questionnaire was created with Google® Forms (Google®, California, USA). The questionnaire link was sent to all Clinicians via e-mail and the dynamic responses were automatically recorded on to the Google® Forms for 3 months (Oct 2022- Jan 2023). All responses were anonymous. The 21-item questionnaire

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was a self-administrated, semi-structured one with close-ended questions accomplish to appraise the clinician's qualification, pre-operative, post operative questionnaire on antibiotic prescription.

In the first part, the experience of the clinician as a dental clinician and also as an implant surgery performing clinician; the workplace of the clinician (solo private practice, group private practice, oral dental health centre of the state, or university clinic) and if there were any, implant surgery-related specialties (oral and maxillofacial surgeon, periodontologist, oral implantologist) of the clinicians were also recorded.

The incidence of preoperative and postoperative antibiotic prescription related to implant surgery was recorded including the type, the dosage, and the duration. In addition to these questions, the reasons for preoperative antibiotic prescription were also recorded. According to the design of the questionnaire, one could choose only one antibiotic regimen for each of the pre and postoperative sections. Finally, because of the irrelevancy of this parameter according to the authors of this study, there was no any defining question about the gender of the clinicians. The participants those holding a degree of MDS, in practicing with implant surgery and those who are willing to participate in the study were included in the study. The incomplete questionnaire was excluded from the study.

Statistical Analysis: The data was analyzed with Statistical Package for Social Sciences (SPSS) for Windows Version 23 (SPSS V23; IBM® Corporation, Armonk, New York, U.S.A). The descriptive and chi-square analyses were used to compare the categorical data. The Kruskal-Wallis test was used to compare the quantitative data by category. The analysis results were expressed as median values (minimum-maximum) for the quantitative data and frequency (percentage) for the categorical data. The significance level was taken as $p < 0.05$.

4. Results

In the first email, 52% of the recipients opened it, and 4.3% of them clicked on it. In contrast, 52.4% of the recipients opened and 3% of them clicked on the second email. A questionnaire for an online survey was emailed to 1058 recipients. Only 384 dentists out of 410 who accessed the survey link finished it, yielding a 93.6% response rate. The average time to complete the questionnaire was 3 minutes and 26 seconds.

Table 1 summarizes the participants' years of experience, working environment, and demographic characteristics. Men made about three-quarters of the participants. 56 percent of the individuals have finished their MDS. Of the participants, 28.12% worked as private practitioners while attending dentistry college. 282 respondents have worked in a dental practice for 11 to 15 years, whereas 336 respondents have worked in dental implantology for 11 to 15 years. Of them, 86.2% have placed 25 to 50 implants annually.

Table 1 - SOCIODEMOGRAPHIC DETAILS

	Frequency	**Percentage**
Gender		
Male	255	66.4
Female	121	31.5
I prefer not to specify	8	0.02
QUALIFICATION		
BDS	125	32.6
MDS	215	56.0

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Post Graduate Student	44	11.4
Affiliation		
Private Practitioner / College	244 80	63.5 20.83
Private Practitioner/ College	88 90	22.9 23.46
Consultant	24 50	6.3 13.02
College, Consultant	3 45	.8 11.2 11.71
College, Private Practitioner	4 108	1.0 28.12
All	21 11	5.5 2.86
Years of experience in dental practice		
11 – 15	282	73.4
6 – 10	67	17.5
Less than 5	20	5.2
More than 15	15	3.9
Years of experience in dental implant surgery		
11 – 15	336	87.5
6 – 10	37	9.6
Less than 5	8	2.1
More than 15	3	0.8
No. of implants placed in a year		
21 – 50	331	86.2
51 – 75	29	7.6
Less than 20	9	2.3
More than 75	15	3.9
Total	**384**	**100.0**

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Responses to the questionnaire about the use of antibiotics in connection with implant placement were limited to dentists who indicated that they place implants. The most often prescribed antibiotics for dental implant placement were metronidazole (37/384, 10.0%; 72/384, 19.0%) pre and post operatively, respectively, and amoxicillin combined with clavulanic acid (155/384, 41.0%; 166/384, 43.0%) or amoxicillin alone (120/384, 31.0%; 99/384, 26.0%) (Table 2).

Table 2 - Dosage of drugs

Condition	**No drugs**	**Amoxicillin500mg BD N(Percentage)**	**Amoxicllin + Clavulonic acid BD**	**Metronidazole 400mg TID**	**Azithromycin 500mg OD**	**Ciprofloxacin 500mg BD**	**Total**	**p-value**
Pre-operative	45(12)	120(31)	155(41)	37(10)	17 (4)	10 (2)	384	0.003*
Post-operative	16(4)	99(26)	166(43)	72(19)	11 (3)	20 (5)	384	

*p<0.05 is considered as statistically significant

When questioned if they frequently gave antibiotic prescriptions Antibiotics were prophylactically provided by 67.5% of the responders prior to dental implant insertion and afterward by 91.4% of them (p = 0.023). The majority of antibiotic prescriptions were written for single-stage implant placement (p = 0.041), immediate implant therapy (p = 0.004), advanced surgical procedures (p = 0.045), and medically compromised patients (p = 0.032) pre- and post-operatively (e.g., with cancer, diabetes, risk of infective endocarditis, or compromised immune system). p = 0.023 was administered orally according to trend. The majority of them were prescribed mouthrinse before and after surgery (p = 0.017), and their preferred medication was chlorhexidine (p = 0.027). An hour before surgery, 190/384 responders received a prophylactic antibiotic prescription, followed by three days postoperatively (188/384) (Table 3).

Table 3 Descriptive variables among the study participants (n=384)

		Pre-operative		**Postoperative**		**p-value**
		Frequency	**Percentage**	**Frequency**	**Percentage**	
Prescription of antibiotics	No	45	11.7	16	4.2	0.023*
	Some times	80	20.8	17	4.4	
	Yes	259	67.5	351	91.4	
Cases in which	No	45	11.7	16	4.2	

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antibiotics is prescribed	One stage implants	138	35.9	267	69.5	0.041*
	Two stage implants	41	10.7	29	7.5	
	Multiple implants	68	17.7	23	6.0	
	Full mouth rehabilitation	92	24.0	49	12.8	
Cases in which antibiotics is prescribed	No	45	11.7	16	4.2	0.004*
	Delayed Implants	102	26.6	78	20.3	
	Early Implants	19	5	20	5.2	
	Immediate implants	166	43.2	162	42.2	
	All	52	13.5	108	28.1	
Cases in which antibiotics is prescribed	**No**	45	11.7	16	4.2	0.045*
	Conventional implant surgery	43	11.2	69	18.0	
	Bone grafting along with implant surgery	62	16.2	35	9.1	
	Advanced surgical procedure during implant surgery	144	37.5	181	47.1	
	All	90	23.4	83	21.6	
Cases in which antibiotics is prescribed	No	45	11.7	16	4.2	0.032*
	Healthy patient	13	3.4	9	2.3	
	Patients with systemic conditions/diseases	131	34.1	149	38.8	

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	Patients with the habit of smoking	127	33.1	104	27.1	
	All	68	17.7	106	27.6	
Routes of administration	No	45	11.7	16	4.2	0.023*
	Oral	332	86.5	360	93.8	
	Parenteral	7	1.8	8	2	
Prefer preoperative mouth rinse prior to implant surgery	No	62	16.1	66	17.2	0.017*
	Yes	322	83.9	318	82.8	
Mouthwash prescribed	**No**	62	16.1	66	17.2	0.027*
	Cetylepyredinium chloride	1	0.3	3	0.7	
	Chlorhexidine	272	70.8	269	70.1	
	Hydrogen peroxide	11	2.9	11	2.9	
	Povidone iodine	38	9.9	35	9.1	

*p<0.05 is considered as statistically significant

Regarding the usual prescription of antibiotics as prophylaxis prior to dental implant installation, the majority stated that they did so in all patients (97/254, 38.2%) or only in patients who had medical conditions that made them more susceptible to infection (e.g., cancer, diabetes, immunocompromised, or at risk of infective endocarditis; 97/254, 38.2%). The others said they wouldn't usually recommend antibiotics for this condition. In general, male dentists prescribe more antibiotics than female dentists (OR = 14.99, p > 10 years of dental degree), although the prescription rate among dentists who graduated up to 10 years before to the study (OR = 2.58, p =.07) was trending down. When compared to dentists who place fewer implants annually, those who place more than 100 implants annually prescribed somewhat more antibiotics as prophylaxis (OR = 1.27, p =.46). Similar tendencies were instead observed between dentists working only in the private practice as compared to the rest of the responders (OR = 0.91, p= .76) (Table 4).

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Table 4 - Prophylaxis and duration of antibiotic before and after surgery among the study participants (n=384)

Preoperative	
Prophylaxis prior to implant placement	**Frequency (Percentage)**
No	45 (11.7)
1 day prior to surgery	80 (20.8)
1 hour prior to surgery	190 (49.5)
2 days prior to surgery	66 (17.2)
Just before the surgery	3 (0.8)
Total	384 (100)
Postoperative	
Duration of antibiotic prescribed after implant surgery	**Frequency (Percentage)**
Don't prescribe	16(4.2)
10 days	4(1.0)
3 days	188(49.0)
5 days	143(37.2)
7 days	33(8.6)
Total	384(100)

5. Discussion

The term "antibiotic therapy" (AT) describes the use of antibiotics to pharmacologically combat a chronic infection. It should be administered based on the location and kind of infection, supported when feasible by bacteriological testing and relevant antibiograms, and continued at the recommended dosages until the infection is totally treated. The term "antibiotic prophylaxis" (AP) describes the use of antibiotics to stop the beginning and spread of an illness when there isn't one. Consequently, AP should be used even more cautiously and meticulously and is not recommended for therapeutic purposes. [12]

Dental implants have emerged as one of the most widely used methods for tooth replacement. The growth of

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bacteraemia surrounding implants is one of the many causes of dental implant failure. Patients who have periodontitis are more likely to acquire bacteraemia because of a heightened host immunological response.[13] In Approximately 10% of antibiotic prescriptions for humans worldwide are written by dentists, either as therapy or prophylaxis [14]. However, up to 80% of antibiotics written as preventative measures before dental procedures are deemed unnecessary [15,16].

The most widely prescribed antibiotic in dentistry is penicillin, particularly amoxicillin, which is frequently taken in conjunction with clavulanic acid [17,18]. This is because it has a wide range of applications, is widely accessible, and has few medication interactions. Mostly, macrolides are utilized for people allergic to the aforementioned compounds.

This 18 items questionnaire based research examined that implant conditions that dentists deal on a daily basis and evaluated their antibiotic-prescribing practices in South India. The aim of the present survey-based study was to investigate the pattern of antibiotic prescription among south Indian dentists, especially in relation to implant dentistry, and their awareness regarding antibiotic resistance. The results of our survey revealed that penicillin-based antibiotics were the most frequently prescribed in relation to implant placement. Nevertheless, antibiotic use prophylactically prior to surgery and postplacement was reported by approximately 80% of participants, especially in medically compromised patients and in cases of bone grafting procedures. The data from the analysis showed wide prescriptive heterogeneity and a non-compliant adherence to international antibiotic-prescribing guidelines. The only guidelines in the literature regarding AP were developed by the American and European cardiologists' associations and concern the prevention of infective endocarditis (IE) [19,20].

In the present study majority of our respondents were male majority of them having their work experience above 11 years placing more than 25 implants per year. The results obtained Among our participants only 31.5% were women, consistent with results from another survey on implant dentistry by Salgado-Peralvo, Peña-Cardelles, et al. and Kathrin Becker et al.(17,18)

The questionnaire about the usage of antibiotics in relation to implant placement was limited to dentists who declared that they insert implants. The majority of prescribed antibiotics were amoxicillin alone or in combination with clavulanic acid, followed by metronidazole, which is consistent with the findings of Shah et al., Sutej et al., Tousi et al., and Subasree Soundarajan et al. despite the fact that our study was limited to the type of antibiotics prescribed in relation to dental implant placement. (19,20,21,22)

In the present study majority of the participants prescribed antibiotics pre and post operatively wherein antibiotics were more commonly prescribed in single stage implant placement, immediate implant therapy, advanced surgical procedures during implant placement and medically compromised patients (e.g. with cancer, diabetes, risk of infective endocarditis, or immunocompromised) pre and post operative respectively. Practioners have prescribed antibiotics an hour before surgery and followed by three days postoperatively. Kathrin Becker et al., Subasree Soundarajan et al., Panda S et al., Yalcin-Ulker et al., has reported findings parallel with the data of this study results in his study. (18,22,23,24) The majority of them were prescribed chlorhexidine mouthrinse before and after surgery in consistent to reports by Salvi GE et al, Truhlar et al.(25,26)

Dentists play an essential role in the appropriate usage of antibiotics, which is significant for providing good quality patient care, reducing the risk of adverse effects and narrowing down the chances of development of antibioticresistant bacteria. Clinicians must think about the potential consequence of their choice of antibiotic prescription on both the individuals and the larger community.

Refrences

1. Albrektsson T, Dahl E, Enbom L, Engevall S, Engquist B, Eriksson AR, et al. Osseointegrated oral implants. A Swedish multicenter study of 8139 consecutively inserted Nobelpharma implants. J Periodontol. 1988;59(5):287–296
2. Esposito M, Hirsch JM, Lekholm U, Thomsen P. Biological factors contributing to failures of osseointegrated oral implants. (I). Success

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www.jchr.org

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criteria and epidemiology. Eur J Oral Sci. 1998;106(1):527–551.

3. Quirynen M, De Soete M, van Steenberghe D. Infectious risks for oral implants: a review of the literature. Clin Oral Implants Res. 2002;13(1):1–19.
4. Romandini M, De Tullio I, Congedi F, Kalemaj Z, D'Ambrosio M, Laforí A, et al. Antibiotic prophylaxis at dental implant placement: which is the best protocol? A systematic review and network meta-analysis. J Clin Periodontol. 2019;46(3):382–395.
5. Adell R, Lekholm U, Branemark PI. Surgical procedures. In: Branemark PI, Zarb GA, Albrektsson T, editors. Tissue integrated prostheses. Chicago: Quintessence Publishing Co, Inc; 1985. pp. 211–232.
6. Flemmig TF, Newman MG. Antimicrobials in implant dentistry. In: Newman MG, Kornman K, editors. Antibiotics/antimicrobial use in dental practice. Chicago: Quintessence Publishing Co, Inc; 1990. pp. 187–200.
7. Esposito M, Grusovin MG, Worthington HV. Interventions for replacing missing teeth: antibiotics at dental implant placement to prevent complications. Cochrane Database Syst Rev. 2013;7:CD004152.
8. Braun RS, Chambrone L, Khouly I. Prophylactic antibiotic regimens in dental implant failure: a systematic review and meta-analysis. J Am Dent Assoc. 2019;150(6):e61–e91.
9. Viola M, Quaratino D, Gaeta F, et al. Allergic reactions to antibiotics, mainly betalactams: facts and controversies. Eur Ann Allergy Clin Immunol. 2005;37(6):223–229.
10. Klinge B, Flemming T, Cosyn J, De Bruyn H, Eisner BM, Hultin M, Isidor F, Lang NP, Lund B, Meyle J, Mombelli A, Navarro JM, Pjetursson B, Renvert S, Schliephake H. The patient undergoing implant therapy. Summary and consensus statements. The 4th EAO consensus conference 2015. Clin Oral Implants Res. 2015;26 Suppl 11:64-67.
11. Lund B, Hultin M, Tranaeus S, Naimi-Akbar A, Klinge B. Complex systematic review—perioperative antibiotics in conjunction with dental implant placement. Clin Oral Implants Res. 2015;26(Suppl 11):1–14.
12. Sukumar S., Martin F., Hughes T., Adler C. Think before You Prescribe: How Dentistry Contributes to Antibiotic Resistance. Aust. Dent. J. 2020;65:21–29. doi: 10.1111/adj.12727. [PubMed] [CrossRef] [Google Scholar]
13. Ramesh A, Varghese SS, Doraiswamy JN, et al. Herbs as an antioxidant arsenal for periodontal diseases. J Intercult Ethnopharmacol 2016; 5:92.
14. Thompson W.,Williams D., Pulcini C., Sanderson S., Calfon P., Verma M. Tackling Antibiotic Resistance: Why Dentistry Matters. Int. Dent. J. 2021;71:450–453. doi: 10.1016/j.identj.2020.12.023. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
15. Suda K.J., Calip G.S., Zhou J., Rowan S., Gross A.E., Hershow R.C., Perez R.I., McGregor J.C., Evans C.T. Assessment of the Appropriateness of Antibiotic Prescriptions for Infection Prophylaxis Before Dental Procedures, 2011 to 2015. JAMA Netw. Open. 2019;2:e193909. doi: 10.1001/jamanetworkopen.2019.3909. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
16. Hubbard C.C., Evans C.T., Calip G.S., Zhou J., Rowan S.A., Suda K.J. Appropriateness of Antibiotic Prophylaxis Before Dental Procedures, 2016–2018. Am. J. Prev. Med. 2022;62:943–948. doi: 10.1016/j.amepre.2021.11.004. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
17. Salgado-Peralvo, A. O., Peña-Cardelles, J. F., Kewalramani, N., JiménezGuerra, A., Velasco-Ortega, E., & Monsalve-Guil, L. (2022). Gender differences among professionals dedicated to Oral Implantology in Spain: An observational study. Journal of Clinical and Experimental Dentistry, 14(2), e153–e157.
18. Becker K, Gurzawska-Comis K, Klinge B, Lund B, Brunello G. Patterns of antibiotic prescription in implant dentistry and antibiotic resistance awareness among European dentists: A questionnaire-based study. Clin Oral Implants Res. 2024 Jul;35(7):771-780.

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14(5), 731-741 | ISSN:2251-6727

19. Shah, S., Wordley, V., & Thompson, W. (2020). How did COVID-19 impact on dental antibiotic prescribing across England? British Dental Journal, 229(9), 601–604.
20. Sutej, I., Lepur, D., Bašić, K., Šimunović, L., & Peroš, K. (2023). Changes in medication prescribing due to COVID-19 in dental practice in Croatia-National Study. Antibiotics, 12(1), 111.
21. Tousi, F., Al Haroni, M., Lie, S. A., & Lund, B. (2023). Antibiotic prescriptions among dentists across Norway and the impact of COVID-19 pandemic. BMC Oral Health, 23(1), 649.
22. Subasree Soundarajan, Priya lochana Gajendran, Current Trends in Antibiotics Prescription Following Dental Implant Placement: A Hospital Based Assessment, J Res Med Dent Sci, 2022, 10(1): 348-354
23. Panda S, Jayakumar ND, Sankari M, et al. Platelet rich fibrin and xenograft in treatment of intrabony defect. Contemp Clin Dent 2014; 5:550.
24. Yalcin-Ulker GM, Cakir M, Meral DG. Antibiotic prescribing habits of the clinicians dealing with dental implant surgery in Turkey: a questionnaire study. Int J Implant Dent. 2020 Sep 27;6(1):66. doi: 10.1186/s40729-020-00252-4.
25. Salvi GE, Ramseier CA. Efficacy of patient-administered mechanical and/or chemical plaque control protocols in the management of peri-implant mucositis. A systematic review. J Clin Periodontol. 2015 Apr;42 Suppl 16:S187-201.

Truhlar, R. S., Morris, H. F. & Ochi, S. (2000) The efficacy of a counter-rotational powered toothbrush in the maintenance of endosseous dental implants. Journal of the American Dental Association 131, 101–107