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Preferences for Antibiotic Prescription among Dental Practitioners and Periodontists In India

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ABSTRACT

INTRODUCTION: Although antimicrobial resistance, one of the principal threats to global public health, is a natural phenomenon, the inappropriate use of antibiotics in humans has accelerated the process with widespread and devastating consequences. Antibiotics are routinely prescribed in dentistry for minor infections, routine endodontic and oral surgical procedures. However, prescription of antibiotics in periodontal diseases has been a debatable topic.

OBJECTIVE: To evaluate the knowledge, awareness and preferences of prescription of antibiotics among dental practitioners, postgraduate students and periodontists in India.

METHODOLOGY: A cross sectional survey was conducted among 208 general dental practitioners, post-graduate students and periodontists in India using an online self-explanatory questionnaire. The questions ranged from choice and duration of antibiotics in periodontal diseases and procedures, antibiotics in pregnancy, awareness of side effects, etc. The answers were assessed and results were tabulated.

RESULTS: The use of antibiotics as an adjunct to SRP was recommended by 94.5%. Most preferred antibiotics were Amoxicillin (85.5%), Metronidazole (80%) and Augmentin (78.5%). 70% of them were aware of the pharmacological vigilance.

CONCLUSION: Although 98% of the practicing dentists preferred use of antibiotics, only about 70% were aware of the dangers of indiscriminate use.

Keywords: antibiotics, dental practitioners, post graduates, periodontists

INTRODUCTION

Over the past 30 years the use of systemic antibiotics in treatment of periodontal disease has been adopted by dentists and periodontists globally due to its effect on the microorganisms.[1] Antimicrobial resistance, one of the imminent threat to the worldwide health, is caused by the unjustified use of antibiotics in humans which has led to rapidly progressing, damaging consequences.[2] Dentists have been prescribing antibiotics for different periodontal diseases with variable outcomes. Many treatment regimens have been tried using variety of antibiotics with varied results. Hence, the confusion persists regarding the role of systemic drug administration in periodontal diseases.

The use of local antibiotic application therapy has been indicated in patients with existing pockets, with the advantages of less adverse effects, low scope for developing antibiotic resistance and good patient compliance. However, because of the issues of

substantivity and the difficulty to achieve minimum inhibitory concentration of the drug in the localized area of application, much of these drugs are not used in routine periodontal therapy.

However the prescription pattern of antimicrobial drugs, whether delivered locally or by systemic route, whether used pre or post non-surgical therapy, the usage of drugs in the treatment of various periodontal diseases, the drug of choice and the regimens used, the use of antibiotics during pregnancy and in lactating mothers, usage of these drugs post-surgical therapy including the procedures employing varied bone grafts, etc has not been well established and a common consensus is needed for the better treatment outcomes and less chances of antibiotic resistance being developed.

Hence, the aim of the current survey was to evaluate the knowledge, awareness and preferences of prescription of antibiotics among dental practitioners, postgraduate students and periodontists in India.

MATERIALS AND METHOD

The main objective of this cross-sectional survey comprising of 208 Dental practitioners, Post-graduate students and Periodontists across India was to assess the prescription pattern of antibiotics in the treatment of periodontal diseases, different drugs and their regimens prescribed, usage of antimicrobial drugs in pregnancy and lactating mothers, use after surgical procedures including flap surgery, mucogingival surgery, implant related procedures.

An online form was created using Google Forms which comprised of various questions pertaining to use of antibiotics in different situations in the treatment of periodontal diseases. The responses were either dichotomous or multiple-choice type which the respondent can choose either single correct answer or more than one answer. The online form was then forwarded to the Dental practitioners, post-graduate students and periodontists practicing in various parts of India using email, and other messaging platforms.

The survey was forwarded to approximately 400+ people in India, out of which 208 responded to the questionnaire. The questionnaire comprised of 20 questions ranging from general questions like age, gender, whether you are dental practitioner, post-graduate student and periodontist to more specific questions regarding the preferences of antibiotic prescription. Other questions included:

1) In periodontal diseases, do you recommend antibiotics?
2) If yes, how antibiotics should be used in periodontal diseases?
3) Would you advise antibiotics pre-prophylaxis or post-prophylaxis?
4) What type of antibiotic delivery system would you prefer for periodontal diseases?
5) In which of the following conditions do you consider antibiotics are indicated?
6) In which of the following conditions do you consider antibiotics are NOT indicated?
7) When systemic antibiotics are indicated, which antibiotic would you choose for the treatment of a periodontal disease in an adult, healthy patient with no medical allergies?
8) How many days would you prescribe the antibiotics for?
9) When systemic antibiotics are indicated, which antibiotic would you choose for the treatment of a periodontal disease in an adult, healthy patient with allergy to penicillin?
10) Which antibiotic would you prescribe to a patient with aggressive periodontitis?
11) Do you prescribe antibiotics during pregnancy?
12) If yes, which of the following antibiotic do you prescribe?
13) Do you take Gynecologists' consent before prescribing antibiotics during pregnancy?
14) Do you prescribe antibiotics in lactating mothers?
15) If yes, which of the following antibiotic do you prescribe?
16) After which periodontal therapy do you recommend antibiotic therapy?
17) After which periodontal therapy you do NOT recommend antibiotic therapy?

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18) Do you think it is mandatory to prescribe antibiotics after mucogingival, graft related surgeries?

19) Do you think it is mandatory to prescribe antibiotics after flap surgeries?

20) Are you aware about pharmacological vigilance?

RESULTS:

The results of the study provided a wide-range of data on the use of antibiotics in periodontal infections within India among various periodontists and dental practitioners.

In total 208 practitioners out of 400 participated in the study from all over India and were eligible for analysis. The respondents age ranged from 22 years to 42 years (mean age 32 years). Overall 58.2% were female respondents and 41.8% were male respondents of which 38% were postgraduates in periodontics, 37% were dental practitioners, and 14.9% from periodontists practicing in different areas in India and 10.01% were post graduates in other specialties other than periodontics.

The average duration of antibiotics prescription proposed by respondents was 5 days (52.9%), 42.8% recommended for 3 days, and 3.4% for 7 days. **(Graph 1)**

In case of healthy patient with no allergy, when asked about the choice of systemic antibiotics in periodontitis patients, 83.2% recommended use of amoxicillin 500mg, 79.8% recommended use of metronidazole 400mg, 77.9% choose amoxclav 625mg, 68.8% choose doxycycline 100/200mg, ciprofloxacin 500mg was recommended by 13.3% and azithromycin was least recommended i.e. about 8.7%. **(Graph 2)**

When the respondents were asked about which antibiotic should be given in patient with allergy to penicillin, 41.8% recommended use of clindamycin 300mg, ciprofloxacin 500mg was recommended by 38.5% and azithromycin 500mg by 19.2%, while 0.5% recommended other drugs for treatment. **(Graph 3)**

In patients with aggressive periodontitis, about 79.8% recommended doxycycline, 42.8% recommended amoxicillin, 13.5% recommended tetracycline, while 1% suggested some other drug as choice of treatment. **(Graph 4)**

Another question was about the periodontal diseases in which antibiotics are considered, highest indication was there in cases with periodontal abscess, necrotizing periodontal disease, necrotizing ulcerative gingivitis, aggressive periodontitis, and pericoronitis with the least indication being in treatment for chronic periodontitis and gingival diseases. **(Graph 5)**

Another question was asked about the type of periodontal surgical treatment after which antibiotics were recommended, in decreasing order the recommendations were for abscess drainage, implant surgery, full mouth flap surgery, root coverage procedures, periodontal plastic surgeries, localized flap surgeries and scaling and root planing was the least recommended. **(Graph 6)**

When asked whether it was mandatory to prescribe antibiotics after mucogingival or graft related surgeries and flap surgery, about 89.4% and 75% respectively recommended use of antibiotics. **(Graph 7)**

Responding to the questions whether antibiotics were preferred in pregnant females 78.4% respondents chose to prescribe antibiotics. In case of lactating mothers, 82.7% respondents chose to prescribe antibiotics. As to taking gynecologist's consent before prescribing antibiotics in pregnant females and lactating mothers 89.9% agreed to taking prior consent. **(Graph 8)**

About choice of antibiotics in pregnant females, 86.1% preferred amoxicillin, then 57.2% chose amoxclav, metronidazole and clindamycin (53.6%) had almost similar preference, with least preference for the ciprofloxacin, doxycycline and azithromycin (10.1%, 8.2%, 5.8% respectively). As for antibiotics preferred in lactating mothers, 84.6% voted for amoxicillin, 63% voted for amoxclav, metronidazole and clindamycin both got almost similar voted of about 52%, ciprofloxacin got 45% preference, with least choice for doxycycline (7.2%) and azithromycin (7%) (**Graph 9)**

DISCUSSION

Periodontal diseases are plaque-induced inflammatory conditions affecting the periodontium,

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which when left untreated can lead to devastating effects on the tooth-supporting structures, further leading to loss of dentition. Various treatment modalities are being used for the treatment of periodontal diseases ranging from the routine non-surgical therapy to surgical therapy with or without the use of adjunctive antibiotics, which can be either delivered locally or by the use of systemic administration.

When correlated with the local delivery of drugs, the systemic use of antibiotics gives a greater benefit by distributing the drug to the bodily fluids such as saliva and the GCF, hence acting on the microorganisms present in the supra and sub-gingival plaque.[3] A common consensus on the added advantage that systemic drugs can give to periodontal treatment was proposed by Herrera et al and Haffajee et al in their reviews published in 2012 and 2003 respectively.[4, 5]

In the present study conducted on 208 respondents, 94.3% accepted that they use antibiotics as an adjunct to scaling and root planing, with 65.4% recommending usage post-prophylaxis and 31.7% recommending use both pre and post prophylaxis. The most common choice of antibiotic delivery route was local administration (72.6%) of the drug at the site, while 25.5% chose the systemic route of administration.

Herrera et al[3](2008) conducted a review and found that if systemic antimicrobials are advised in a periodontal therapy, it should be in conjunction with scaling and root planing. In a research study conducted by Harrera et al[4] (2012) to assess the efficacy of adjunctive use of local and systemic antibiotics in the treatment of periodontal diseases, it was suggested that even though clinical use and the positive effects of antibiotics is evident, there is still a lacking of evidence to support the dosage, regimen and choice of antibiotics. Winkelhoff A and Winkel E (2009)[6] suggested systemic use of antibiotics in treatment of periodontal diseases has been clinically efficacious; however, not every antibiotic was equally effective.

In a study to evaluate the prescribing patterns of antibiotics of dentists in Iran, Vessal et al [7] (2011) concluded that amoxicillin was the most preferable drug for all clinical conditions. He also concluded that dentists did not prefer to prescribe antibiotics for cases of gingivitis, chronic periodontitis, but 63% prescribed antimicrobial drugs for necrotizing periodontal diseases. This was in accordance to the results found in the present study where dentists did not show indication of antibiotics in cases of gingival diseases (81.7%) and chronic periodontitis (69.2%). Also, dentists indicated prescribing antibiotics for cases of necrotizing ulcerative periodontitis (87.0%) and necrotizing ulcerative gingivitis (82.7%).

The local administration of the antimicrobial drugs can gain over 100 times more effects in sites when compared by systemic administration. In addition, professionally applied topical antimicrobials increases the compliance of patients.[8] The results in the present survey mirrors this understanding where 72.6% respondents suggested the use of local administration of antibiotics while only 25.5% preferred systemic route. However, the main drawback of local drug delivery is difficulty in placing therapeutic concentrations of antimicrobial agent into deeper parts of periodontal pockets and furcation lesions.[9]

The use of antibiotics during pregnancy and lactation has always been a dispute, the drug of choice for pregnant and lactating mothers being penicillin and cephalosporin antibiotics (e.g. amoxicillin and cephalexin).[10] The results of the present survey also clearly indicated amoxicillin as the preferred drug for pregnant (86.1%) and lactating mothers (84.6%).

CONCLUSION

Although 98% of the practicing dentists preferred use of antibiotics, only about 70% were aware of the dangers of indiscriminate use. Judicious use of antibiotics is must, so as to avoid antibiotic resistance and to gain successful treatment outcome for various periodontal diseases and procedures.

CONFLICT OF INTEREST

None

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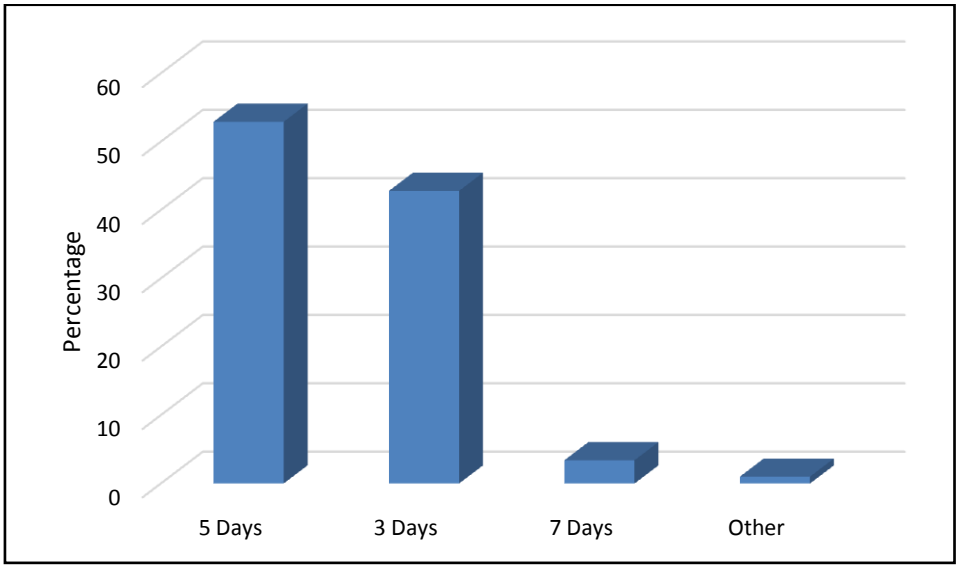
GRAPHS:



Graph 1: Average duration of antibiotic prescription.

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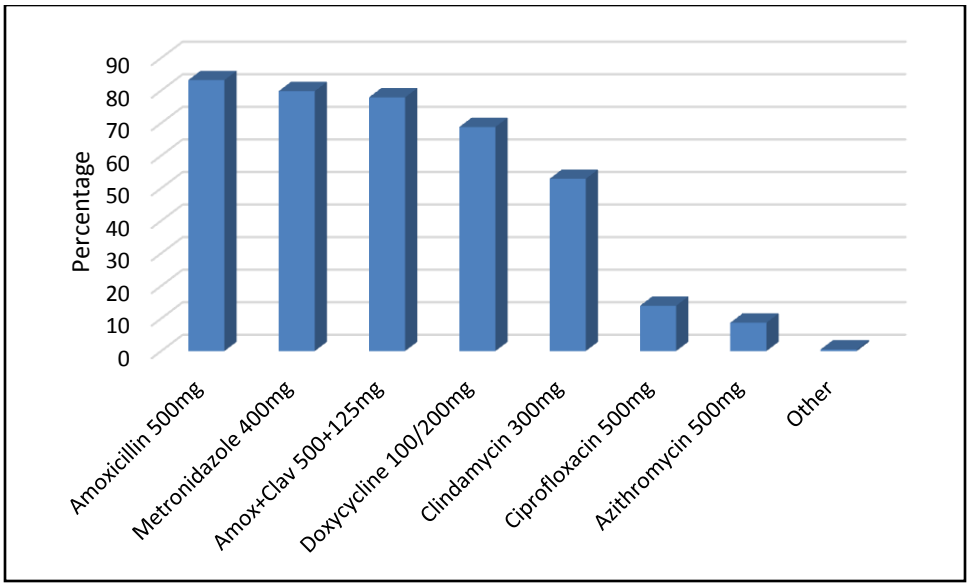
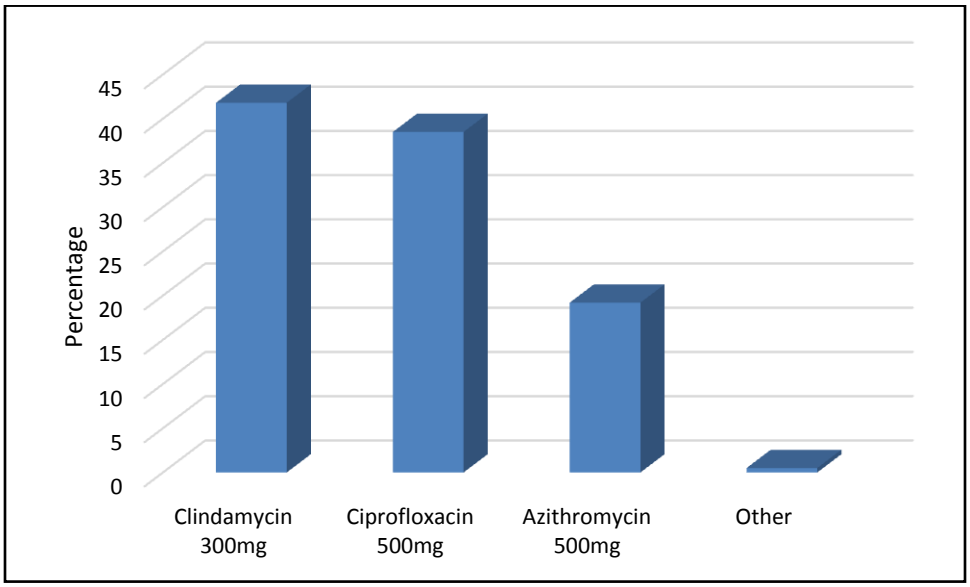


Graph 2: Choice of antibiotics in periodontal diseases.



Graph 3: Choice of antibiotics in patients with allergy to penicillin.

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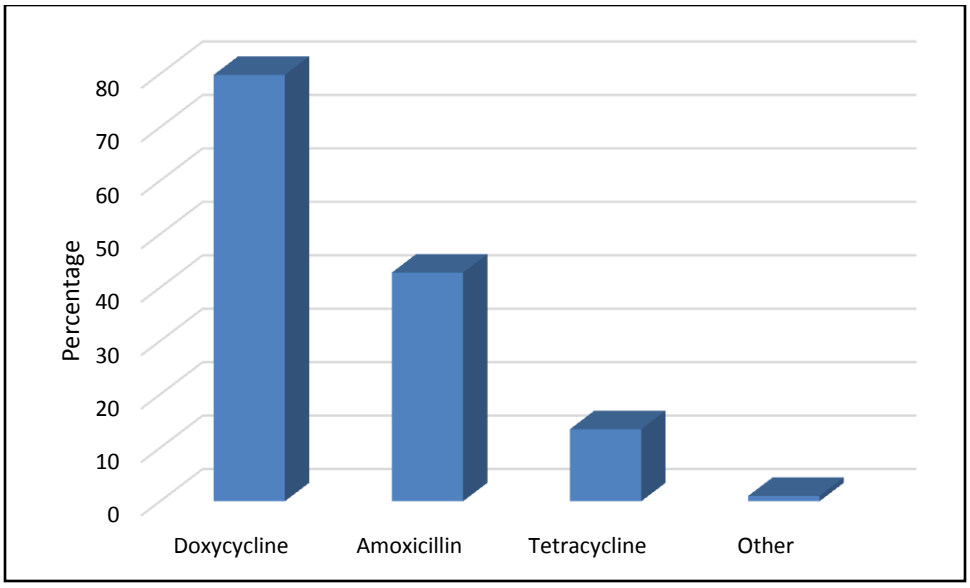
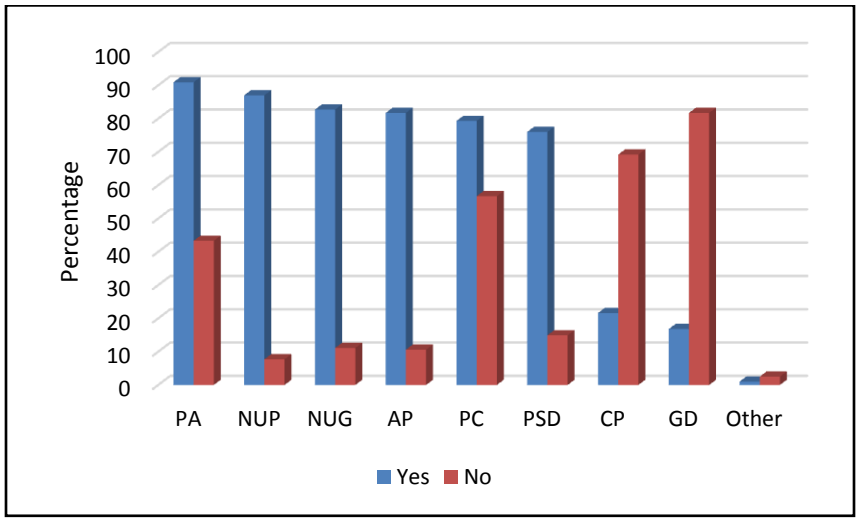


Graph 4: Choice of antibiotics in patients with aggressive periodontitis.



Graph 5: Indication of antibiotics in periodontal diseases.

PA- periodontal abscess, NUP- necrotizing ulcerative periodontitis, NUG-necrotizing ulcerative gingivitis, AP-aggressive periodontitis, PC- pericoronitis, PSD- periodontitis as a manifestation of systemic disease, CP-chronic periodontitis, GD-gingival disease)

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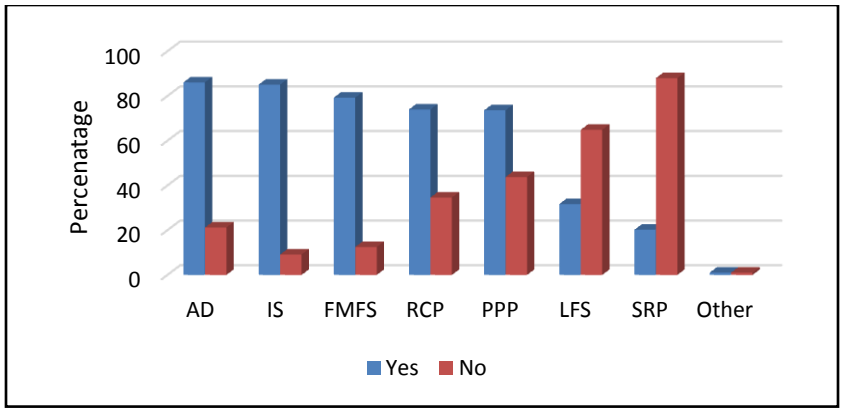
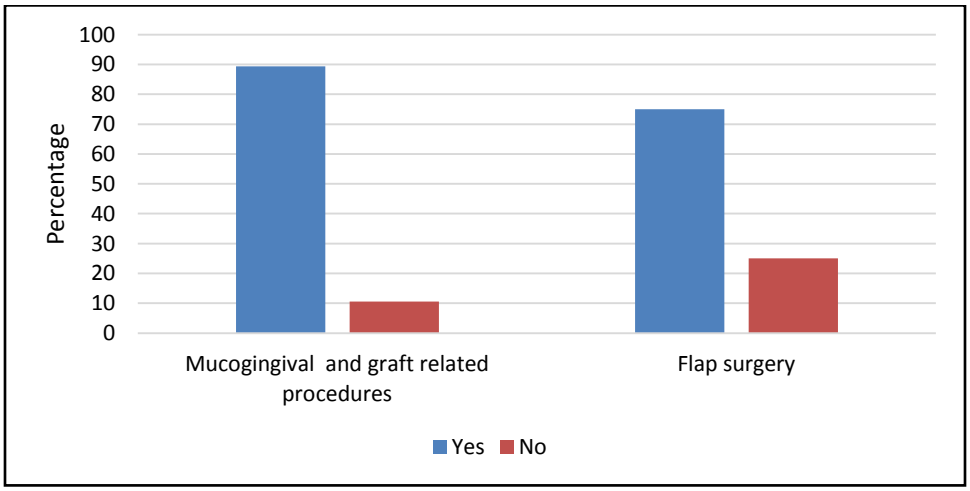
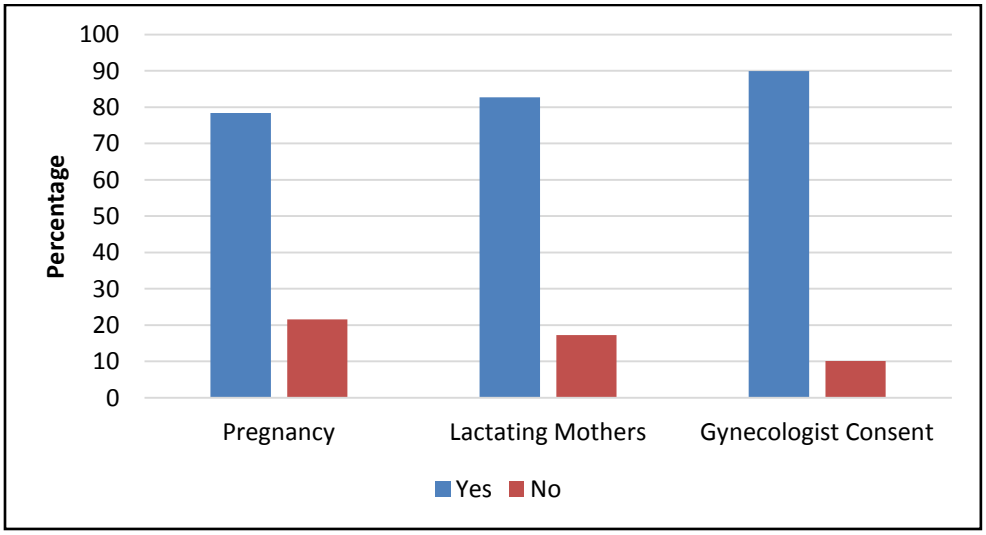


Graph 6: Type of surgical periodontal therapy after which antibiotics are recommended.

(AD- abscess drainage, IS- implant surgery, FMPS- full mouth flap surgery, RCP- root coverage procedure, PPP-periodontal plastic surgery, LFS-localized flap surgery, SRP-Scaling and root planing)



Graph 7: Indication of antibiotics after mucogingival or graft related procedures, flap surgery.



Graph 8: Indication for antibiotic prescription in pregnant/ lactating mothers and about taking gynaecologist's consent before prescribing antibiotics.

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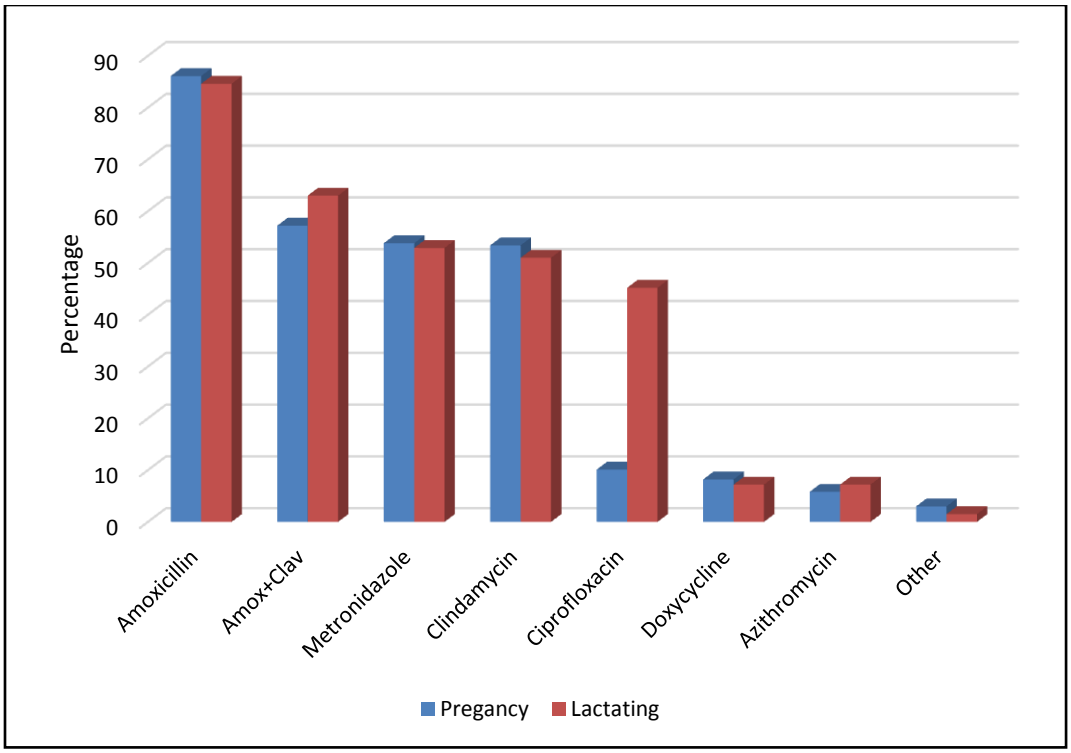

Graph 9: Choice of antibiotics in pregnant females and lactating mothers.

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