

Assessment of common analgesics and antibiotics prescribed to patients undergoing flap surgery

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ABSTRACT:

Aim: The aim of this study was to assess the commonly prescribed antibiotics and analgesic medications to patients after undergoing a periodontal flap surgery.

Background: Periodontal flap is the surgical procedure that involves sectioning the gingiva/mucosa so as to separate it from the underlying tissues to gain access to the root surface and the bone. Pain following a periodontal flap surgery is very common. Management of the pain following a flap surgery is done by prescribing analgesics along with antibiotics to prevent bacterial invasions.

Materials and Methods: This study was conducted within a university setting. A total of about 5,00,000 case sheets were analysed and a final of 1,188 records were shortlisted. The data was obtained and tabulated using MS Excel sheets. The data was then exported to SPSS software for further analysis. Descriptive statistics and Chi-square tests were carried out using the software.

Results: Results obtained after statistical analysis were presented as graphs and charts. The results obtained show that Zerodol P is the most widely prescribed analgesic and Amoxicillin is the most widely prescribed antibiotic to patients after flap surgery. Both of these were most commonly prescribed among all age groups and both genders considered for the study.

Conclusion: From this study, we can conclude that Zerodol P was the most commonly prescribed analgesic and Amoxicillin was the most commonly prescribed antibiotic after a periodontal flap surgery because of their efficiency and cost effectiveness. Further analysis can be done using a larger sample size to obtain more accurate results.

INTRODUCTION:

Flap surgery is a common procedure done in case of deep periodontal pockets, involvement of root bifurcation and persistent inflammation surrounding the tooth. Post operative pain is a very common finding after a periodontal flap surgery. The success of a periodontal surgery not only depends on the treatment but also depends on the management of the various post operative complications that follow the treatment. Pain is the most common postoperative complication after a periodontal surgery. (1) The degree of pain varies from person to person. Postoperative pain is managed by prescribing Analgesics to the patient. (2) Periodontal treatments are known to induce higher levels of pain, hence postoperative pain management is very important. (3) Periodontal treatments are very frequently known to cause infections post surgery. This is prevented by prescribing an ideal antibiotic. (4) There is no fixed protocol that can be followed postoperatively after a periodontal surgery as different pain relieving methods may suit different patients. (5)

Antibiotic treatment that is usually given after periodontal flap surgery is mainly targeted at eradicating pathogens that can cause irritation and infection thereby hindering the healing process. Systemic antibiotic therapy has proven to be of more use than topical antibiotics. (6) (7) Recently, antibiotics are given as a prophylaxis in surgeries of oral cavity to reduce the risk of infections and bacteremias. (8) Postoperative prescription of antibiotics will lead to lower pain levels, will improve wound healing and treatment outcomes. However, it should be kept in mind that unnecessary exploitation and use of antibiotics may lead to resistance in bacteria. (9) Multiple antibiotics are used after periodontal treatments like tetracycline, minocycline, doxycycline, erythromycin, clindamycin, ampicillin, amoxicillin and metronidazole. (10,11) These antibiotics function in different ways. Some attack the cell wall of the bacteria and disrupt it. Some other antibiotics function by inhibiting the protein biosynthesis which is extremely essential for bacterial function. Another class of antibiotics inhibit DNA replication of the bacteria. (12)

Analgesics are prescribed following a flap surgery to relieve the patient from pain. Various studies show that analgesics given after surgeries have led to significantly lower levels of pain. Analgesics like Ibuprofen are more commonly prescribed since they have lower addiction tendencies and have lesser effects on CNS. (13,14) There are different types of analgesics prescribed commonly after periodontal procedures, like Dolo-650, Imol, Imol plus, Combiflam, Zerodol P and Zerodol SP.(15)(16) The mode of action of these analgesics is widely known as inhibition of peripheral prostaglandin synthesis thereby inhibiting pain. (17) The aim of this study was to assess the most common analgesics and antibiotics prescribed to patients undergoing flap surgery.

MATERIALS AND METHODS:

This study is a retrospective study conducted in a university setting. An ethical approval was obtained from the Institutional Ethical Approval Board to access patient records and data. A total of 5,00,000 case sheets were analysed from June 2019 to February 2021 using Dental Information Archiving Software [DIAS]. Suitable criteria were applied and a final of 1,188 case sheets were shortlisted for the study. Incomplete data and other treatments were excluded from the study. Patients undergoing flap surgery were included for the study. This study involves 2 people. The data was cross verified by the second examiner. A random sampling method was used to minimise the sampling bias. Since this study was conducted within a university setting, it has a high internal validity and a very low external validity. In From the 1,188 case sheets obtained, the necessary data such as age, gender and antibiotic/analgesics prescribed were collected and tabulated using Microsoft Excel sheets. This data was then exported to IBM SPSS Software Version 23 (Chicago). Further statistical analysis was carried out using SPSS. Descriptive statistics and Chi-square testing was done to draw a comparison between age, gender and the antibiotic or analgesic prescribed. All the data obtained after analysis was represented in the form of graphs and pie charts.

RESULTS:

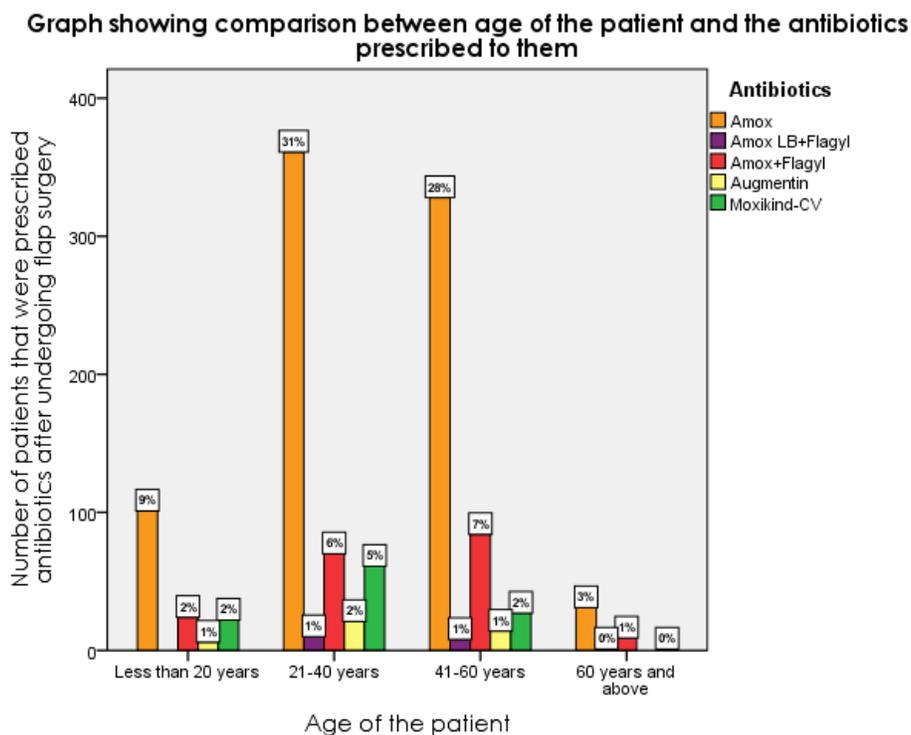


Figure 1. Represents a comparison between age of the patient and the antibiotics prescribed to those patients after undergoing flap surgery. X axis represents the age of the patient. Y axis represents the number of patients that were prescribed antibiotics. Orange represents Amox, which is the most commonly prescribed antibiotic(31%). Purple represents Amox LB + Flagyl which was very rarely prescribed(1%). Red represents Amox+flagyl which was prescribed to 1-7% of the population of varying ages. Yellow represents augmentin which was also prescribed infrequently(1-2%). Green represents the percentage of people that were prescribed Moxikind, which is 2-5%. From the graph we can see that Amox is the most commonly prescribed antibiotic amongst all age groups.

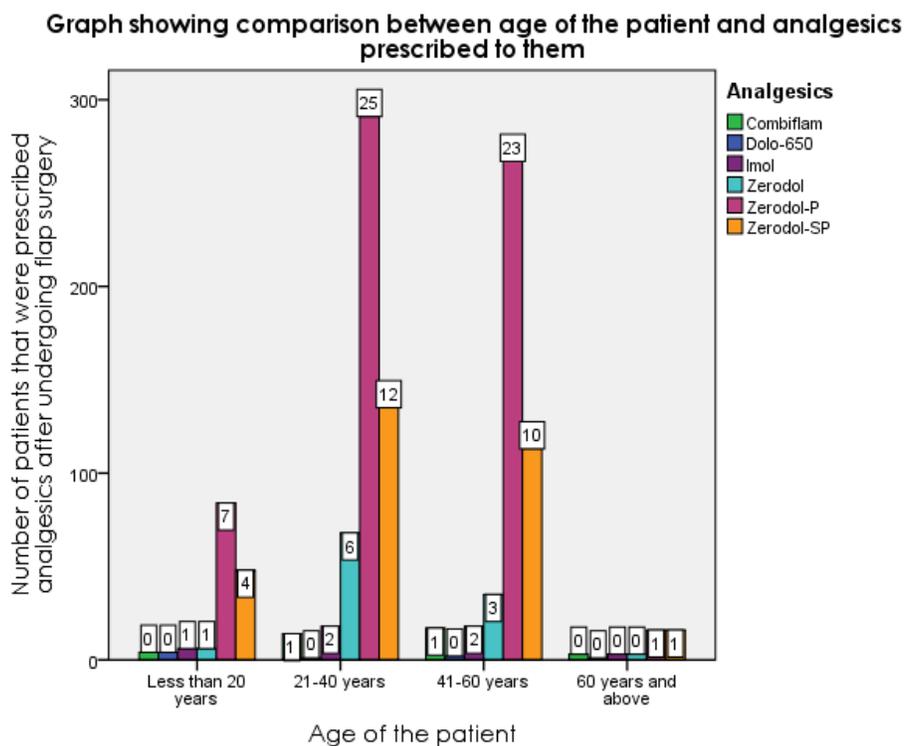


Figure 2.

Represents a comparison graph between age of the patient and the type of analgesic prescribed to the patient after undergoing flap surgery. X axis represents the age of the patient. The Y axis represents the number of the patient. Green represents Combiflam which was prescribed to less than 1% in all ages. Pink represents Zerodol P which was most commonly prescribed across all age groups(25%). Light Blue represents Zerodol, which was prescribed to 3-6% of the population. Purple represents Imol which was prescribed to less than 2% of the patients. Dark Blue represents the prescription of Dolo-650 which was very rarely prescribed. Orange represents Zerodol SP, which was prescribed to 4-12% of the population. From this graph, we can see that Zerodol P is the most commonly prescribed analgesic to patients after undergoing flap surgery.

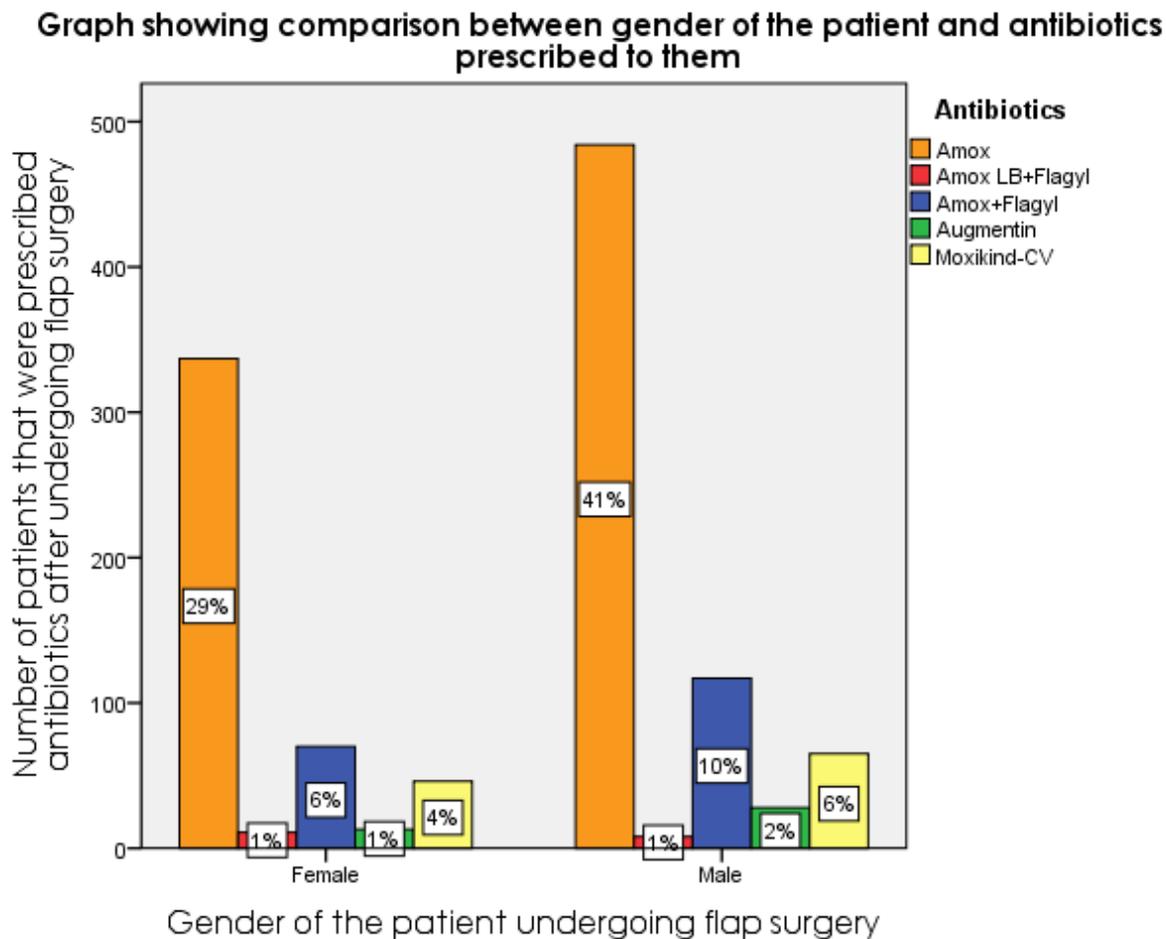
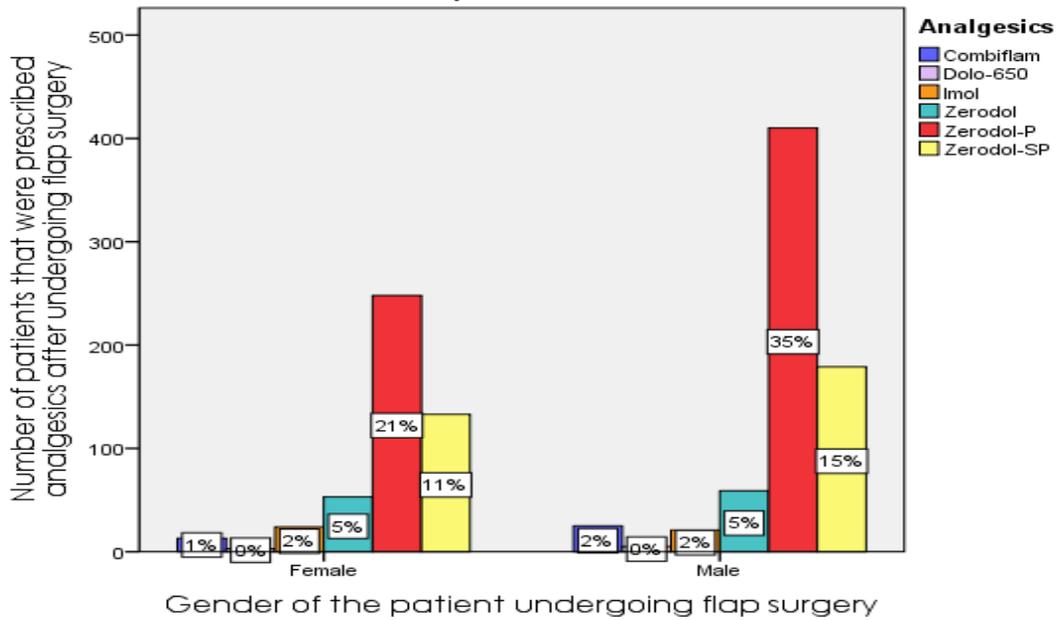


Figure 3. Represents the comparison between gender of the patient and antibiotics prescribed to them after flap surgery. The X axis represents the gender of the patient and Y axis represents the number of patients that were prescribed antibiotics. Amox is represented by Orange, which is prescribed the most widely in males(41%) as well as females(29%). Blue represents Amox + Flagyl which is the second most commonly prescribed antibiotic 6% in females and 10% in males. Red represents Amox LB+ Flagyl, Green represents Augmentin and Yellow represents Moxikind CV. From this graph, we can see that Amox is the most commonly prescribed antibiotic amongst both genders.

Figure 4. Shows a comparison graph between gender of the patient and the analgesics prescribed to the patients after flap surgery. The X axis represents the gender of the patient. Y axis represents the number of patients that are undergoing flap surgery. Red represents Zerodol P which is the most commonly prescribed analgesic in males (35%) as well as females (21%). Yellow represents Zerodol SP which is the second most commonly prescribed analgesic in males (15%) as well as females (11%). Combiflam is represented by Blue, Imol is represented by Orange and Dolo 650 is represented by light purple. From this

Graph representing a comparison between gender of patient and analgesic prescribed to them



graph we can see that Zerodol P is the most commonly prescribed analgesic in males and females undergoing flap surgery.

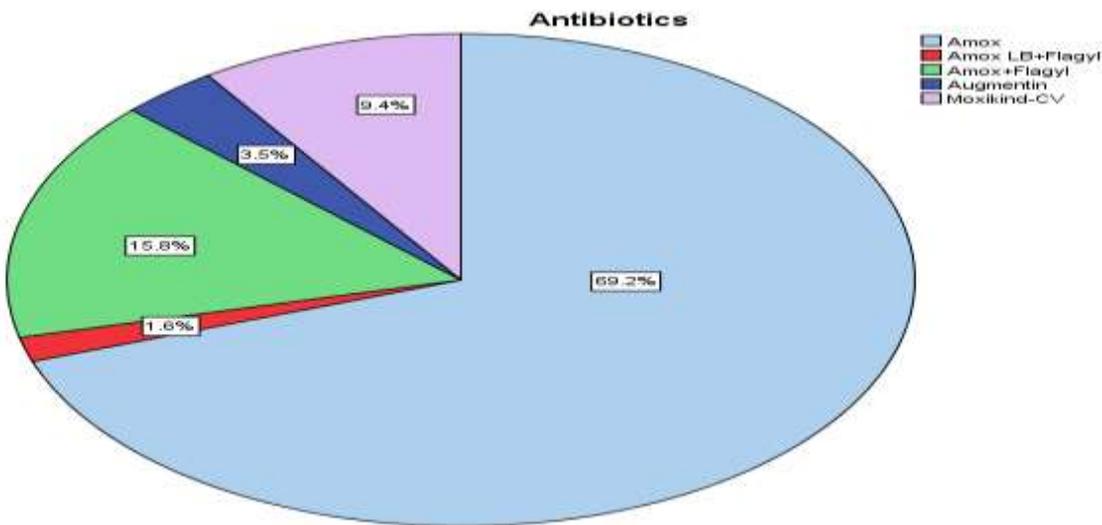


Figure 5. Represents a pie chart depicting the percentage distribution of antibiotics that were prescribed to patients after undergoing a periodontal flap surgery. Light blue represents Amox which is the most commonly prescribed antibiotic (69.2%) followed by Amox + Flagyl (15.8) which is depicted by green colour. Amox LB +Flagyl (1.6%) represented by Red, Augmentin represented by Dark blue and Moxikind CV (9.4%) represented by light purple were least prescribed. From this chart, we can see that Amox was the most commonly prescribed antibiotic and Amox LB + Flagyl was the least prescribed antibiotic

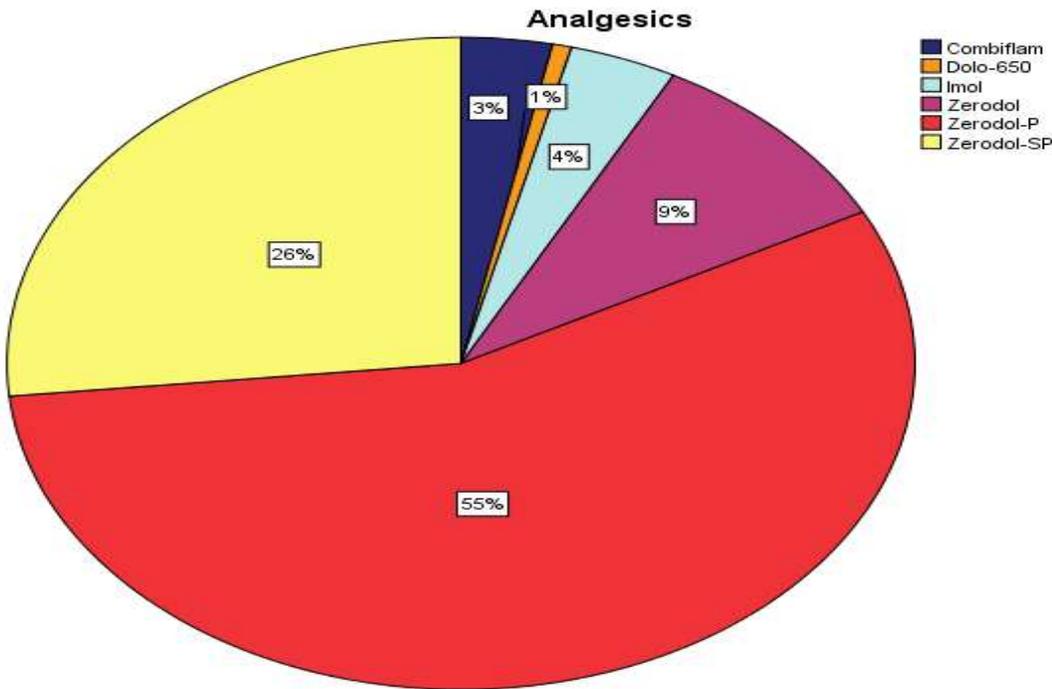


Figure 6. Represents a pie chart depicting the percentage distribution of analgesics in patients after undergoing flap surgery. Zerodol P represented by Red is the most commonly prescribed analgesic (55%), followed by Zerodol SP (26%) represented by yellow. Other less frequently prescribed analgesics prescribed include Zerodol represented by Pink (9%), Imol represented by Light blue (4%), Combiflam represented by Dark blue (3%) and Dolo 650 represented by orange (1%). From this chart we can see that Zerodol P is most prescribed and Dolo 650 is least prescribed to patients after undergoing flap surgery.

DISCUSSION:

The results obtained from this study showed that Amoxicillin is one of the most commonly prescribed antibiotics. These results can be compared to the results obtained by Kanwarjit et al, 2010, which proved that amoxicillin is commonly used and is highly effective in reducing postoperative bacteremia and it also prevents any possible sequelae in susceptible patients. Amoxicillin is a very cost efficient and easily available drug. It has an effective action against various bacteria. In this study, antibiotics were administered to every patient after undergoing a flap surgery as a mandatory procedure to prevent postoperative bacterial infections. A study done by Oswal et al, shows that the risk of bacterial infections after a periodontal flap surgery is less than 1% and hence, antibiotics are not always required. On obtaining the most commonly prescribed analgesics, Zerodol P was found to be the most effective for relieving pain after a periodontal surgery. A study done by Seymour et al, 2016, also shows that it is an effective analgesic for controlling postoperative pain.

Our team has extensive knowledge and research experience that has translate into high quality publications.(18–37)

CONCLUSION:

Amoxicillin was the most prescribed antibiotic after a flap surgery among all age groups and both genders. The most commonly prescribed analgesic was Zerodol P. These drugs are the most effective in their respective roles of preventing infections and relieving pain after surgery. Further analysis and studies can be conducted with a larger sample size, aiming to achieve a higher external validity and minimising internal validity.

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CONFLICT OF INTEREST:

Nil

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REFERENCES:

1. Diwan V, Srinivasa TS, Ramreddy KY, Agrawal V, Nagdeve S, Parvez H. A comparative evaluation of transdermal diclofenac patch with oral diclofenac sodium as an analgesic drug following periodontal flap surgery: A randomized controlled clinical study. *Indian J Dent Res.* 2019 Jan;30(1):57–60.
2. Das R, Deshmukh J, Asif K, Sindhura H, Devarathanamma MV, Jyothi L. Comparative evaluation of analgesic and anti-inflammatory efficacy of ibuprofen and traumeel after periodontal flap surgery: A randomized triple-blind clinical trial. *J Indian Soc Periodontol.* 2019 Nov;23(6):549–53.
3. Mei C-C, Lee F-Y, Yeh H-C. Assessment of pain perception following periodontal and implant surgeries. *J Clin Periodontol.* 2016 Dec;43(12):1151–9.
4. Oswal S, Ravindra S, Sinha A, Manjunath S. Antibiotics in periodontal surgeries: A prospective randomised cross over clinical trial. *J Indian Soc Periodontol.* 2014 Sep;18(5):570–4.
5. Caporossi LS, Dos Santos CS, Calcia TBB, Cenci MS, Muniz FWMG, da Silveira Lima G. Pharmacological management of pain after periodontal surgery: a systematic review with meta-analysis. *Clin Oral Investig.* 2020 Aug;24(8):2559–78.
6. Slots J, Rams TE. Antibiotics in periodontal therapy: advantages and disadvantages. *J Clin Periodontol.* 1990 Aug;17(7 (Pt 2)):479–93.

7. Salvi GE, Mombelli A, Mayfield L, Rutar A, Suvan J, Garrett S, et al. Local antimicrobial therapy after initial periodontal treatment [Internet]. Vol. 29, *Journal of Clinical Periodontology*. 2002. p. 540–50. Available from: <http://dx.doi.org/10.1034/j.1600-051x.2002.290611.x>
8. Kanwarjit A, Gill A, Mahajan S. Postoperative bacteremia in periodontal flap surgery, with and without prophylactic antibiotic administration: A comparative study [Internet]. Vol. 14, *Journal of Indian Society of Periodontology*. 2010. p. 18. Available from: <http://dx.doi.org/10.4103/0972-124x.65430>
9. Powell CA, Mealey BL, Deas DE, McDonnell HT, Moritz AJ. Post-surgical infections: prevalence associated with various periodontal surgical procedures. *J Periodontol*. 2005 Mar;76(3):329–33.
10. Kapoor A, Malhotra R, Grover V, Grover D. Systemic antibiotic therapy in periodontics [Internet]. Vol. 9, *Dental Research Journal*. 2012. p. 505. Available from: <http://dx.doi.org/10.4103/1735-3327.104866>
11. Van Winkelhoff AJ, Rams TE, Slots J. Systemic antibiotic therapy in periodontics [Internet]. Vol. 10, *Periodontology* 2000. 1996. p. 45–78. Available from: <http://dx.doi.org/10.1111/j.1600-0757.1996.tb00068.x>
12. Kapoor G, Saigal S, Elongavan A. Action and resistance mechanisms of antibiotics: A guide for clinicians. *J Anaesthesiol Clin Pharmacol*. 2017 Jul;33(3):300–5.
13. Vogel RI, Desjardins PJ, Major KV. Comparison of presurgical and immediate postsurgical ibuprofen on postoperative periodontal pain. *J Periodontol*. 1992 Nov;63(11):914–8.
14. Kyselovič J, Koscova E, Lampert A, Weiser T. A Randomized, Double-Blind, Placebo-Controlled Trial of Ibuprofen Lysinate in Comparison to Ibuprofen Acid for Acute Postoperative Dental Pain [Internet]. Vol. 9, *Pain and Therapy*. 2020. p. 249–59. Available from: <http://dx.doi.org/10.1007/s40122-019-00148-1>
15. Shreya Kothari BGS. Commonly Prescribed Analgesics Post Surgical, Electrosurgical & Laser Gingivectomy/Gingivoplasty- A Retrospective Study. *International Journal of Dentistry and Oral Science (IJDOS)*. :61–5.
16. Suresh M, Balaji S, Nivethigaa B. Comparative Analysis of Commonly Prescribed Analgesics After Frenectomy And Frenotomy with Scalpel and Laser - A Retrospective Study [Internet]. Vol. 11, *Journal of Complementary Medicine Research*. 2020. p. 254. Available from: <http://dx.doi.org/10.5455/jcmr.2020.11.03.32>
17. Cashman JN. The Mechanisms of Action of NSAIDs in Analgesia [Internet]. Vol. 52, *Drugs*. 1996. p. 13–23. Available from: <http://dx.doi.org/10.2165/00003495-199600525-00004>
18. Ramesh A, Varghese S, Jayakumar ND, Malaiappan S. Comparative estimation of sulfiredoxin levels

- between chronic periodontitis and healthy patients - A case-control study. *J Periodontol.* 2018 Oct;89(10):1241–8.
19. Paramasivam A, Priyadharsini JV, Raghunandhakumar S, Elumalai P. A novel COVID-19 and its effects on cardiovascular disease. *Hypertens Res.* 2020 Jul;43(7):729–30.
 20. S G, T G, K V, Faleh A A, Sukumaran A, P N S. Development of 3D scaffolds using nanochitosan/silk-fibroin/hyaluronic acid biomaterials for tissue engineering applications. *Int J Biol Macromol.* 2018 Dec;120(Pt A):876–85.
 21. Del Fabbro M, Karanxha L, Panda S, Bucchi C, Nadathur Doraiswamy J, Sankari M, et al. Autologous platelet concentrates for treating periodontal infrabony defects. *Cochrane Database Syst Rev.* 2018 Nov 26;11:CD011423.
 22. Paramasivam A, Vijayashree Priyadharsini J. MitomiRs: new emerging microRNAs in mitochondrial dysfunction and cardiovascular disease. *Hypertens Res.* 2020 Aug;43(8):851–3.
 23. Jayaseelan VP, Arumugam P. Dissecting the theranostic potential of exosomes in autoimmune disorders. *Cell Mol Immunol.* 2019 Dec;16(12):935–6.
 24. Vellappally S, Al Kheraif AA, Divakar DD, Basavarajappa S, Anil S, Fouad H. Tooth implant prosthesis using ultra low power and low cost crystalline carbon bio-tooth sensor with hybridized data acquisition algorithm. *Comput Commun.* 2019 Dec 15;148:176–84.
 25. Vellappally S, Al Kheraif AA, Anil S, Assery MK, Kumar KA, Divakar DD. Analyzing Relationship between Patient and Doctor in Public Dental Health using Particle Memetic Multivariable Logistic Regression Analysis Approach (MLRA2). *J Med Syst.* 2018 Aug 29;42(10):183.
 26. Varghese SS, Ramesh A, Veeraiyan DN. Blended Module-Based Teaching in Biostatistics and Research Methodology: A Retrospective Study with Postgraduate Dental Students. *J Dent Educ.* 2019 Apr;83(4):445–50.
 27. Venkatesan J, Singh SK, Anil S, Kim S-K, Shim MS. Preparation, Characterization and Biological Applications of Biosynthesized Silver Nanoparticles with Chitosan-Fucoidan Coating. *Molecules* [Internet]. 2018 Jun 12;23(6). Available from: <http://dx.doi.org/10.3390/molecules23061429>
 28. Alsubait SA, Al Ajlan R, Mitwalli H, Aburaisi N, Mahmood A, Muthurangan M, et al. Cytotoxicity of Different Concentrations of Three Root Canal Sealers on Human Mesenchymal Stem Cells. *Biomolecules* [Internet]. 2018 Aug 1;8(3). Available from: <http://dx.doi.org/10.3390/biom8030068>
 29. Venkatesan J, Rekha PD, Anil S, Bhatnagar I, Sudha PN, Dechsakulwatana C, et al. Hydroxyapatite from Cuttlefish Bone: Isolation, Characterizations, and Applications. *Biotechnol Bioprocess Eng.* 2018 Aug 1;23(4):383–93.

30. Vellappally S, Al Kheraif AA, Anil S, Wahba AA. IoT medical tooth mounted sensor for monitoring teeth and food level using bacterial optimization along with adaptive deep learning neural network. *Measurement*. 2019 Mar 1;135:672–7.
31. PradeepKumar AR, Shemesh H, Nivedhitha MS, Hashir MMJ, Arockiam S, Uma Maheswari TN, et al. Diagnosis of Vertical Root Fractures by Cone-beam Computed Tomography in Root-filled Teeth with Confirmation by Direct Visualization: A Systematic Review and Meta-Analysis. *J Endod*. 2021 Aug;47(8):1198–214.
32. R H, Ramani P, Tilakaratne WM, Sukumaran G, Ramasubramanian A, Krishnan RP. Critical appraisal of different triggering pathways for the pathobiology of pemphigus vulgaris-A review. *Oral Dis [Internet]*. 2021 Jun 21; Available from: <http://dx.doi.org/10.1111/odi.13937>
33. Ezhilarasan D, Lakshmi T, Subha M, Deepak Nallasamy V, Raghunandhakumar S. The ambiguous role of sirtuins in head and neck squamous cell carcinoma. *Oral Dis [Internet]*. 2021 Feb 11; Available from: <http://dx.doi.org/10.1111/odi.13798>
34. Sarode SC, Gondivkar S, Sarode GS, Gadbail A, Yuwanati M. Hybrid oral potentially malignant disorder: A neglected fact in oral submucous fibrosis. *Oral Oncol*. 2021 Jun 16;105390.
35. Kavarthapu A, Gurumoorthy K. Linking chronic periodontitis and oral cancer: A review. *Oral Oncol*. 2021 Jun 14;105375.
36. Vellappally S, Abdullah Al-Kheraif A, Anil S, Basavarajappa S, Hassanein AS. Maintaining patient oral health by using a xeno-genetic spiking neural network. *J Ambient Intell Humaniz Comput [Internet]*. 2018 Dec 14; Available from: <https://doi.org/10.1007/s12652-018-1166-8>
37. Aldhuwayhi S, Mallineni SK, Sakhamuri S, Thakare AA, Mallineni S, Sajja R, et al. Covid-19 Knowledge and Perceptions Among Dental Specialists: A Cross-Sectional Online Questionnaire Survey. *Risk Manag Healthc Policy*. 2021 Jul 7;14:2851–61.