



INTERNATIONAL JOURNAL OF RESEARCH IN PHARMACEUTICAL SCIENCES

Published by JK Welfare & Pharmascope Foundation

Journal Home Page: <https://ijrps.com>

Prevalence of Mandibular Third Molar Pericoronitis among Smokers and Evaluation of its treatment outcomes - A Retrospective Study

Pooja Umaiyal M, Jaiganesh Ramamurthy*

Department of Periodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India

Article History:

Received on: 24 Jul 2020
 Revised on: 10 Aug 2020
 Accepted on: 24 Aug 2020

Keywords:

Operculum,
 Pericoronitis,
 Smokers,
 Third molars

ABSTRACT



Pericoronitis is an infectious disease affecting the operculum overlying a semi-erupted or erupting tooth. Pericoronitis occurs mainly or particularly on the lower third molars. It is painfully debilitating at times and it's a common periodontal emergency found for many diseases, with tobacco being the major modifiable risk factor. It has a negative impact over oral health and oral hygiene. The aim of this study is to analyse the prevalence of pericoronitis among smokers. Patients included in this retrospective study were those with a diagnosis of pericoronitis from July 2019 till March 2020. Socio-demographic and clinical data of all the 109 patients collected such as age, gender, tooth or teeth affected by pericoronitis and treatment undergone were retrieved from the recorded details of the patients. This data was tabulated in excel and then imported to SPSS software for statistical analysis. During the study period, 109 patients presented with pericoronitis. The peak age for the prevalence of pericoronitis was 20-25 years accounting for 75.2% of the patients. The prevalence of lower left third molar (54.1%) being affected with pericoronitis was higher than the lower right third molar being affected (45.9%). Extraction (95.4%) was the frequently performed treatment for pericoronitis. Pericoronitis occurs more often in 20-25 years of age patients who are smokers. While the lower left third molar being the most common tooth involved in pericoronitis and extraction of the affected teeth was the treatment of choice among the majority of the population.

*Corresponding Author

Name: Jaiganesh Ramamurthy
 Phone: 98404 43463
 Email: jaiganeshr@saveetha.com

ISSN: 0975-7538

DOI: <https://doi.org/10.26452/ijrps.v11iSPL3.2963>

Production and Hosted by

IJRPS | <https://ijrps.com>

© 2020 | All rights reserved.

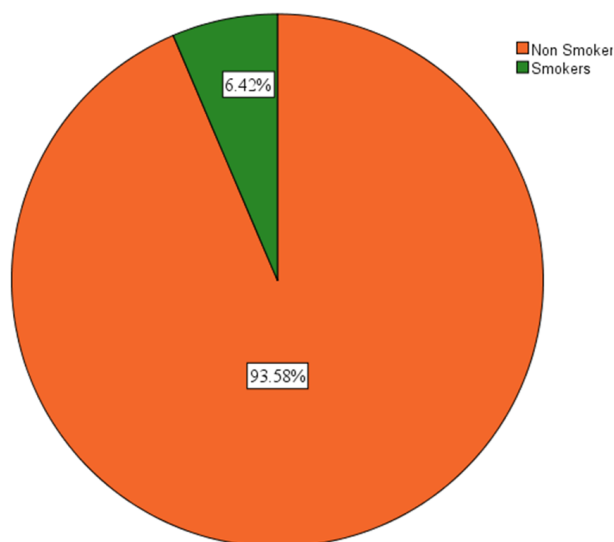
INTRODUCTION

Pericoronitis is an inflammation of the operculum that is soft tissue covering the crown of an

unerupted tooth or partially erupted tooth and it is also called as operculitis (McNutt *et al.*, 2008). An operculum is a clinical term for the soft tissue covering a partially erupted tooth. A developed operculum surrounding the teeth tends to accumulate more bacterial plaque retention in between and when it's affected by the masticatory trauma caused by the opposing tooth, the condition sets to be aggravated.

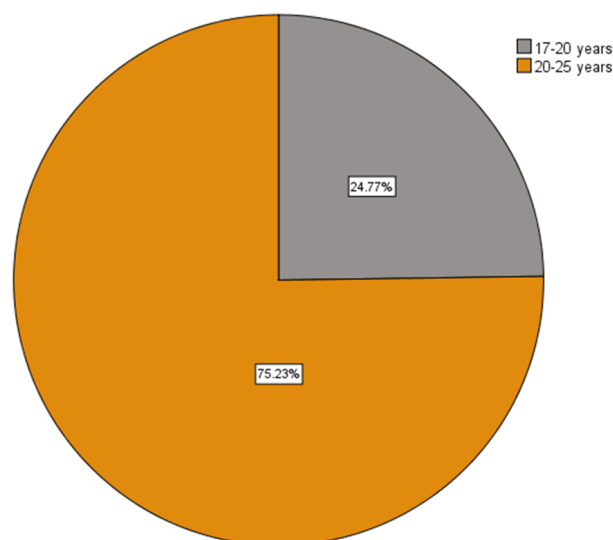
Symptoms of pericoronitis may range from mild discomfort to a very painful state which includes pain, swelling, and difficulty in swallowing, enlargement of the affected lymph nodes, fever, malaise, bad odour or altered taste. It can be associated with purulent exudates of the operculum which can be tested by digital pressure in that region, feeling nau-

sea and lack of appetite (Yurttutan *et al.*, 2020). The clinical category of the disease is closely related to the frequency and intensity of these symptoms. The sequelae of such an infection are well recognised, as it may spread anteriorly or posteriorly along the fascial planes to involve the vestibular, buccal, submasseteric, submental, submandibular and pterygoid spaces (Andrews, 1967). This can lead to cellulitis, extraoral sinus formation and Ludwig's angina, which are of considerable clinical importance. Acute pericoronitis, sub-acute pericoronitis and chronic pericoronitis are three categories of clinically and diagnostically recognised pericoronitis. Acute pericoronitis is characterized by decreased mouth opening and very severe symptomatology, almost the same pattern with reduced intensity and with normal mouth opening is seen in sub-acute pericoronitis (Kumar, 2017). Chronic pericoronitis refers to a patient describing a short duration low-grade pain without characteristic symptomatology (Marciani, 2012; Moloney and Stassen, 2008).

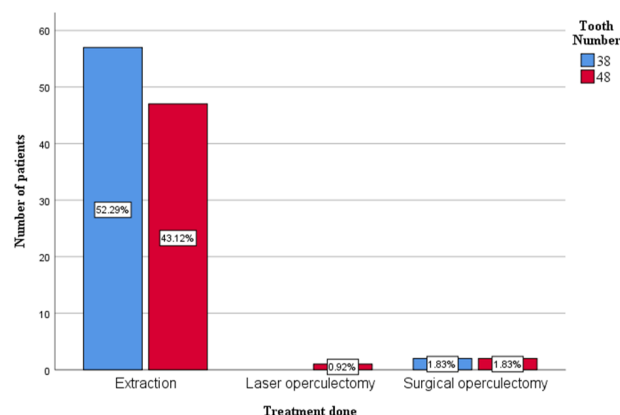


Graph 1: Pie chart representing the distribution of pericoronitis among smoking and non-smoking patients

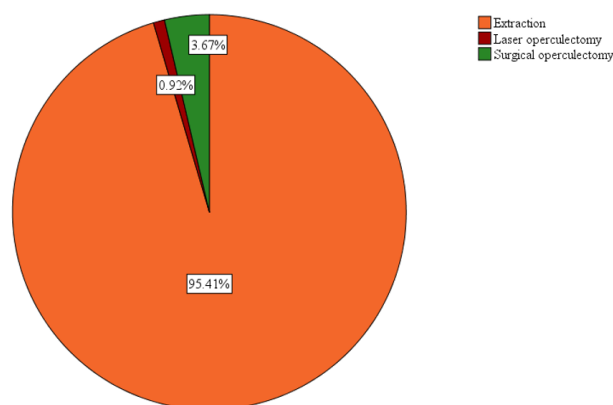
Pericoronitis could be a leading cause for extraction of permanent third molars and one of the conditions could include the precautionary extraction of impacted third molars (Chestnutt *et al.*, 2000; Costa *et al.*, 2013). The infection is multimicrobial, predominantly caused strictly by beta-lactamase-producing anaerobic microorganisms (Gutiérrez-Pérez, 2004). The prevalence of third molar related pericoronitis is the lowest. The most prevalent type is chronic pericoronitis affecting the lower right second permanent molar. The peak age of occurrence of pericoronitis varied from 21 to 25 years of age constituting 55.2% of the patients.



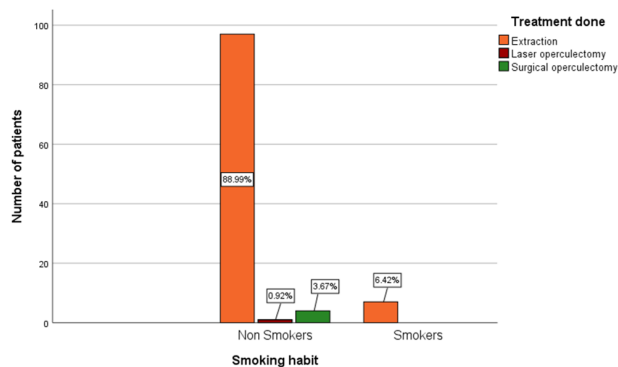
Graph 2: Pie chart representing the frequency distribution of patients affected with pericoronitis according to the age group



Graph 3: Bar chart representing the association between the types of treatment performed for patients with pericoronitis and the tooth affected by pericoronitis



Graph 4: Pie chart representing patients with pericoronitis distributed according to the type of treatment performed on the affected tooth



Graph 5: Bar graph showing the association between the presence or absence of smoking habit and the treatment pericoronitis which is statistically significant p value of 0.000(>0.05)

The soft tissues adjacent to vertically inclined partially erupted mandibular third molars are more frequently affected by pericoronitis than teeth that are soft tissue impacted or erupted. The vertical (28%) and distoangular (28%) impaction was more prevalent tooth relationship between the pericoronitis and status of the impacted third molar, especially in vertical and distoangular position (Indira *et al.*, 2013; Ramesh *et al.*, 2016a).

For many diseases, smoking is considered an established risk factor (Haber *et al.*, 1993). The newest plaque of the twentieth century is tobacco with it expanding exponentially with its usage or utilisation. One hundred eighty-two million smokers abide in India among the humongous population of 930 million worldwide tobacco users. By 2020 World Health Organization appraisal evaluated that tobacco-related demise may surpass 1.5 million every year or 13% of all passing in India (Vellappally *et al.*, 2008). The use of tobacco around the world has been a major modifiable risk factor for health. Nicotine dependence includes both mental and physical dependence (Ramesh *et al.*, 2017, 2016b). There are numerous unfriendly consequences for oral and dental being on smoking cigarettes (Souza and Markou, 2011). Oral malignant growth, periodontal illness, delayed healing of the extraction socket, the main source of tooth loss, discoloured teeth and tongue, awful breath, decreased feeling of taste and smell are among the impacts (Khalid *et al.*, 2017; Vellappally *et al.*, 2008).

Smoking exerts a strong, chronic and dose-dependent suppressive effect on gingival bleeding on probing (Ramesh *et al.*, 2016a). When compared to the non-smokers, bleeding on probing was less evident in smokers which indicates its effect on gingival blood vessels. The exact mechanisms by

which smoking suppresses gingival bleeding is not understood yet (Dietrich *et al.*, 2004). Based on various study reports it is understood that smokers may present with a lower level of gingival inflammation, it has been accepted for the fact that the gingival blood flow in smokers is lesser than in non-smoking individuals. Smoking is thought to affect the periodontal tissues mainly by the vascular and immunological response of the body as it would also induce a decreased local host response. Previously our team had conducted numerous clinical trials (Ravi *et al.*, 2017), in-vitro studies involving periodontal disease pathogenesis (Priyanka *et al.*, 2017; Varghese *et al.*, 2015), comparative studies (Ramamurthy and Visha, 2018; Kavarthapu and Thamaraiselvan, 2018), Evaluation studies (Khalid *et al.*, 2017; Thamaraiselvan *et al.*, 2015), case reports (Panda *et al.*, 2014; Ramesh *et al.*, 2017, 2019), systematic reviews (Avinash *et al.*, 2017; Mootha *et al.*, 2016) reviews (Khalid *et al.*, 2016; Ramesh *et al.*, 2016b) and literature reviews (Ramesh *et al.*, 2016b) over the past many years. Now we are focusing on epidemiological studies related to periodontal disease. Thus the aim of this present study is to assess the prevalence of pericoronitis among smokers.

MATERIALS AND METHODS

A retrospective study was conducted in a University setting at Saveetha Dental College and Hospitals. The advantage of conducting this study in a University setting was the ease of Data Collection containing similar ethnicity with the involvement of both the genders. The unavailability of location-specific data was the disadvantage of this study. Ethical approval for conducting the study was obtained from the Institutional Scientific Review Board, Saveetha Dental College and Hospitals.

Data collected for this study was from the patients who had visited the institutional dental hospital for treatment between June 2019 and March 2020. A total of 109 patients' details who were diagnosed with pericoronitis or had undergone extraction of third molar or operculectomy due to pericoronitis were collected. Sampling bias for the study was minimised by including all the required data. Data was collected from the patient records maintained by the hospital and was then tabulated in excel and then imported into SPSS software. Incomplete data was verified with the concerned department or patient or excluded from the study.

The collected data included age, gender, tooth involved and treatment is done. A statistical test was done using a chi-square test with the software

SPSS by IBM. Independent variables included age and gender of the participants, whereas the dependent variables included the smokers, gingival index, plaque index of the patients. All of these were analysed using correlation and association.

RESULTS AND DISCUSSION

A total of 109 patients who ranged from 17-25 years of age with pericoronitis were examined, among which 6.4% were smokers and the rest were non-smokers (Graph 1). Prevalence of pericoronitis was more evident among thenon-smoking patients compared to smoking patients.

High prevalence of pericoronitis was seen among the age group of 20-25 years, with 75.2% (Graph 2). Higher prevalence of pericoronitis was seen among the age group of 20-25 years (75.23%) and The lower left third molar (54.1%) was the most common site for pericoronitis to occur with extraction (52.29%) being the predominant type of treatment done, followed by the lower right third molar (45.9%) also with extraction (43.12%) being the most predominant type of treatment done and laser operculectomy (0.92%) being the least type of treatment done among the study population. (Graph 3). Extraction as a treatment for the pericoronitis is highly prevalent with 95.4% when compared to other treatments for pericoronitis like surgical operculectomy and laser operculectomy with 3.7% and 0.09% prevalence respectively with a statistically insignificant p-value of >0.05 (Graph 4). However, based on the presence or absence of smoking habit extraction was highly predominant among non-smokers and smokers with 88.9% and 6.4% respectively. It is statistically significant with p-value <0.05 (Graph 5).

Over the past 15 years, the correlation between smoking and periodontal diseases has been studied extensively and both cross-sectional and longitudinal studies provide strong epidemiologic evidence of a positive association between smoking. Clinical and radiographic signs of periodontitis also show an increased risk of periodontitis in smokers (Darby, 1983; Haber, 1994; Preber and Bergstrom, 1990). Even when the levels of plaque accumulation and gingival inflammation were not significantly different between smokers and nonsmokers, smokers exhibited an increase in prevalence as well as the severity of the destructive disease. The relationship between smoking and periodontitis appears to be dose-dependent.

Smoking habit causes changes in the gingival epithelium and gingival connective tissue. Smokers develop narrowing of blood vessels around the

range of $\leq 0.5\mu$ in diameter and decrease in inflammatory cell infiltration like neutrophils than non-smokers do. The epithelial changes are so significant that it mimics early phases of dysplastic changes may be a common finding in smokers but not in nonsmokers. A study showed that there was a decrease in the density of blood vessels and due to that, reduced inflammatory cell infiltrations were also detected in smokers (Sreedevi *et al.*, 2012). Various study results showed that the consequences of smoking on vascular endothelium are caused by hazardous nicotine compounds. Nicotine causes stimulation of the production of amines like adrenaline and noradrenaline, which causes vasoconstriction and in turn leads to the decrease in the nature of bleeding and exudates production (Sreedevi *et al.*, 2012). Gradual reduction in capillary diameter and decreased density of blood vessels in the gingival connective tissues of smokers is the causative factor for the reduction of gingival index. Inflammatory responses also decreased for smokers. This causes a reduction of inflammation and bleeding. Hence these inflammatory signs are markedly decreased in smokers. This finding is usually compared with gingival health status and makes the clinician believe that it's healthy (Lie *et al.*, 1998; Preber and Bergström, 1985). Hence, smokers are more prone to develop pericoronitis, but the smoking frequency is not proportionately associated with the disease.

In this study, the population contains only males, females were purposely excluded from the study for the main purpose that it would be difficult to recruit females who admit that they smoke. Since patients with any known systemic problems were not included, it was considered reasonable that comparisons made between the smokers and non-smokers were accurately reflected on the influence of smoking on pericoronitis. This was contradicted by Ayanbadejo *et al.*, who reported having 59.5% of females with pericoronitis and 40.5% of males (Ayanbadejo and Umesi-Koleoso, 2008). This can be attributed to the fact that unlike western society in which habits like smoking or drinking have almost been identically distributed among males and females.

The present study reported the highest prevalence of pericoronitis among the age group of 20-25 years with 75.2% which was in accordance with the study by Ayanbadejo *et al.* (Ayanbadejo and Umesi-Koleoso, 2008), reporting the peak period being 19-23 years. Kalsaron *et al.* (Katsarou *et al.*, 2019), showed the peak period as between 20-25 years with 72.41% and Trvelan Treventanov *et al.* (Tsvetanov, 2018), with a report showing 55.2%

of the prevalence of pericoronitis occurring at the age group of 21-25 years. The reason for this age dependence is because there is increased exposure to smoking to an individual after the age of 19 years caused by various factors like personality factors (openness, conscientiousness, extraversion, and neuroticism), cognitive factors (sense of self-efficacy and coherence), peer pressure, coping resources (friends and family social support) and demographic factors (gender and ethnicity).

In the current study, the lower left third molar was the most prevalent site of pericoronitis (54.1%) followed by the lower right third molar. This was supported by studies reported by Ayabadejo et al. (Ayanbadejo and Umesi-Koleoso, 2008), who similarly reported 45.3% of lower left molars to be predominant that 37% of lower right molars with a bilateral concurrent pericoronitis was noted in 17.7% of patients. A reason suggested by Sangal (Sangal, 1984) for this difference was that most of the impacted teeth remain unattended to in their patients, which may lead to occasional attacks of pericoronitis and may thus occur on both sides of jaw concurrently.

Operculectomy is a procedure involving minor surgery where the affected soft tissue/ the flap of gum over the molars, is cut away, preventing further build-up of debris and plaque and subsequent inflammation. The inflamed/infected, painful operculum are often removed by operculectomy which is the surgical excision or ablation of the operculum. It can be performed through various types of techniques: scalpel, CO₂ laser, caustic agents, electro-surgery, cautery, radiofrequency surgery, or hot-tip diode surgery. In our present study extraction of the tooth involved has been predominant with 95.4% followed by surgical operculectomy and laser operculectomy.

The limitation of the study conducted includes the reduction or availability of the data, the unequal distribution of the cases and the unavailability of location-specific data. Hence, the results of this study must be interpreted within the limitations of this study and further cohort studies must be done, including larger data size. Such a study should also include the other associated parameters like angulation of impacted, bilateral pericoronitis, etc.

CONCLUSION

Pericoronitis is commonly seen periodontal problem which could be attributed to multiple factors. Within the limits of this study, the prevalence of pericoronitis occurring in patients who are smokers is more in the age group of 20-25 years. Hence

smoking habit has a role in triggering the severity of the disease. With the lower left third molar being the most common tooth involved in pericoronitis, care needs to be given in early diagnosis of the condition and if diagnosed later, the only extraction of the affected teeth was the treatment of choice.

Authors Contributions

Conceptualisation: Pooja Umaiyal and Jaiganesh Ramamurthy; Methodology: Pooja Umaiyal and Jaiganesh Ramamurthy; Validation: Pooja Umaiyal and Jaiganesh Ramamurthy; formal analysis: Pooja Umaiyal and Jaiganesh Ramamurthy; writing-original draft preparation: Pooja Umaiyal; writing-review, editing and visualisation: Jaiganesh Ramamurthy.

Acknowledgment

I am sincerely thankful to the Director, Dean of Saveetha Dental College and Hospital, Chennai for providing me with the opportunity to write a research paper in the form of a dissertation on the topic "Prevalence of pericoronitis among smokers."

I am also thankful to Professor Jaiganesh Ramamurthy for guiding me in every stage of this research paper. Without his support, it would have been very difficult for me to prepare the paper so meaningfully.

I also would like to thank the Department of Information Technology of Saveetha Dental College and Hospital, who had helped me during the course of this research paper for the collection of required data of the patients.

Conflict of Interest

The authors declare that they have no conflicts of interest for this study.

Source of Funding

Self-Funded Research Project.

REFERENCES

- Andrews, A. G. 1967. Pericoronitis. *Oral health*, 57(8):550-551.
- Avinash, K., Malaippan, S., Dooraiswamy, J. N. 2017. Methods of Isolation and Characterization of Stem Cells from Different Regions of Oral Cavity Using Markers: A Systematic Review. *International Journal of Stem Cells*, 10(1):12-20.
- Ayanbadejo, P. O., Umesi-Koleoso, D. C. 2008. A retrospective study of some socio-demographic factors associated with pericoronitis in Nigerians. *West African Journal of Medicine*, 26(4):302-305.
- Chestnutt, I. G., Binnie, V. I., Taylor, M. M. 2000. Reasons for tooth extraction in Scotland. *Journal of Dentistry*, 28(4):295-297.

- Costa, M. G., Pazzini, C. A., Pantuzo, M. C. G. 2013. Is there justification for prophylactic extraction of third molars? A systematic review. *Brazilian oral research*, 27(2):183-188.
- Darby, M. L. 1983. Collaborative practice model: the future of dental hygiene. *Journal of Dental Education*, 47(9):589-593.
- Dietrich, T., Bernimoulin, J.-P., Glynn, R. J. 2004. The Effect of Cigarette Smoking on Gingival Bleeding. *Journal of Periodontology*, 75(1):16-22.
- Gutiérrez-Pérez, J. L. 2004. Third molar infections. *Medicina oral. patología oral y cirugía bucal*, 9:122-127.
- Haber, J. 1994. Smoking is a major risk factor for periodontitis. *Current opinion in periodontology*, pages 12-18.
- Haber, J., Wattles, J., Crowley, M. 1993. Evidence for cigarette smoking as a major risk factor for periodontitis. *Journal of periodontology*, 64(1):16-23.
- Indira, A. P., Kumar, M., David, M. P. 2013. Correlation of Pericoronitis and the Status of Eruption of Mandibular Third Molar: A Clinico Radiographic Study. *Journal of Indian Academy of Oral Medicine and Radiology*, 25(2).
- Katsarou, T., Kapsalas, A., Souliou, C., Stefaniotis, T., Kalyvas, D. 2019. Pericoronitis: A clinical and epidemiological study in greek military recruits. *Journal of Clinical and Experimental Dentistry*, 11(2):e133-e137.
- Kavarthapu, A., Thamaraiselvan, M. 2018. Assessing the variation in course and position of inferior alveolar nerve among south Indian population: A cone beam computed tomographic study. *Indian Journal of Dental Research*, 29(4):405-405.
- Khalid, W., Vargheese, S., Lakshmanan, R., Sankari, M., Jayakumar, N. D. 2016. Role of endothelin-1 in periodontal diseases: A structured review. *Indian Journal of Dental Research*, 27(3):323-323.
- Khalid, W., Vargheese, S. S., Sankari, M. 2017. Comparison of Serum Levels of Endothelin-1 in Chronic Periodontitis Patients Before and After Treatment. *Journal of clinical and diagnostic research: JCDR*, 11(4):78-81.
- Kumar, S. 2017. Relationship between dental anxiety and pain experience during dental extractions. *Asian J Pharm Clin Res*, 10(3):458-61.
- Lie, M. A., Timmerman, M. F., Velden, U., Weijden, G. A. 1998. Evaluation of 2 methods to assess gingival bleeding in smokers and non-smokers in natural and experimental gingivitis. *Journal of Clinical Periodontology*, 25(9):695-700.
- Marciani, R. D. 2012. Is There Pathology Associated With Asymptomatic Third Molars? *Journal of Oral and Maxillofacial Surgery*, 70(9):S15-S19.
- McNutt, M., Partrick, M., Shugars, D. A., Phillips, C., White, R. P. 2008. Impact of Symptomatic Pericoronitis on Health-Related Quality of Life. *Journal of Oral and Maxillofacial Surgery*, 66(12):2482-2487.
- Moloney, J., Stassen, L. F. A. 2008. The relationship between pericoronitis, wisdom teeth, putative periodontal pathogens and the host response. *Journal of the Irish Dental Association*, 54(3):134-137.
- Mootha, A., Malaiappan, S., Jayakumar, N. D., Varghese, S. S., Thomas, J. T. 2016. The Effect of Periodontitis on Expression of Interleukin-21: A Systematic Review. *International Journal of Inflammation*, 2016:1-8.
- Panda, S., Jayakumar, N. D., Sankari, M., Varghese, S., Kumar, D. 2014. Platelet rich fibrin and xenograft in treatment of intrabony defect. *Contemporary Clinical Dentistry*, 5(4):550-550.
- Preber, H., Bergström, J. 1985. Occurrence of gingival bleeding in smoker and non-smoker patients. *Acta Odontologica Scandinavica*, 43(5):315-320.
- Preber, H., Bergstrom, J. 1990. Effect of cigarette smoking on periodontal healing following surgical therapy. *Journal of Clinical Periodontology*, 17(5):324-328.
- Priyanka, S., Kaarthikeyan, G., Nadathur, J. D. 2017. Detection of cytomegalovirus, Epstein-Barr virus, and Torque Teno virus in subgingival and atherosclerotic plaques of cardiac patients with chronic periodontitis. *Journal of Indian Society of Periodontology*, 21(6):456-460.
- Ramamurthy, J., Visha, M. G. 2018. Comparison of the effect of hiora mouthwash versus chlorhexidine mouthwash in gingivitis patients: a clinical trial. *Asian Journal of Pharmaceutical and Clinical Research*, 11(7):84-88.
- Ramesh, A., Ravi, S., Kaarthikeyan, G. 2017. Comprehensive rehabilitation using dental implants in generalized aggressive periodontitis. *Journal of Indian Society of Periodontology*, 21(2):160-160.
- Ramesh, A., Vargheese, S., Doraiswamy, J., Malaiappan, S. 2016a. Herbs as an antioxidant arsenal for periodontal diseases. *Journal of Intercultural Ethnopharmacology*, 5(1):92-92.
- Ramesh, A., Vargheese, S. S., Jayakumar, N. D., Malaiappan, S. 2016b. Chronic obstructive pulmonary disease and periodontitis - unwinding their linking mechanisms. *Journal of Oral Biosciences*, 58:23-26.

- Ramesh, A., Vellayappan, R., Ravi, S., Gurumoorthy, K. 2019. Esthetic lip repositioning: A cosmetic approach for correction of gummy smile – A case series. *Journal of Indian Society of Periodontology*, 23(3):290–290.
- Ravi, S., Malaiappan, S., Varghese, S., Jayakumar, N. D., Prakasam, G. 2017. Additive Effect of Plasma Rich in Growth Factors With Guided Tissue Regeneration in Treatment of Intrabony Defects in Patients With Chronic Periodontitis: A Split-Mouth Randomized Controlled Clinical Trial. *Journal of Periodontology*, 88(9):839–845.
- Sangal, N. C. 1984. Pericoronitis: a study of nature and etiology. *Journal of the Indian Dental Association*, 56(3):103–109.
- Souza, M. S. D., Markou, A. 2011. Neuronal mechanisms underlying the development of nicotine dependence: implications for novel smoking-cessation treatments. *Addiction science & clinical practice*, 6(1):4–16.
- Sreedevi, M., Ramesh, A., Dwarakanath, C. 2012. Periodontal Status in Smokers and Nonsmokers: A Clinical, Microbiological, and Histopathological Study. *International Journal of Dentistry*, 2012:1–10.
- Thamaraiselvan, M., Elavarasu, S., Thangakumaran, S., Gadagi, J., Arthie, T. 2015. Comparative clinical evaluation of coronally advanced flap with or without platelet rich fibrin membrane in the treatment of isolated gingival recession. *Journal of Indian Society of Periodontology*, 19(1):66–66.
- Tsvetanov, T. 2018. Association of the mandibular third molar position to the pericoronitis. *International Journal of Medical Research & Health Sciences*, 7(2):35–40.
- Varghese, S., Thomas, H., Jayakumar, N. D., Sankari, M., Lakshmanan, R. 2015. Estimation of salivary tumor necrosis factor-alpha in chronic and aggressive periodontitis patients. *Contemporary Clinical Dentistry*, 6(6):152–152.
- Vellappally, S., Jacob, V., Šmejkalová, J., Shriharsha, P., Kumar, V., Fiala, Z. 2008. Tobacco Habits and Oral Health Status in Selected Indian Population. *Central European Journal of Public Health*, 16(2):77–84.
- Yurttutan, M. E., Karaahmetoğlu, Ö., Üçok, C., Bağış, N. 2020. Comparison of the quality of life of patients with mandibular third molars and mild pericoronitis treated by extraction or by a periodontal approach. *British Journal of Oral and Maxillofacial Surgery*, 58(2):179–184.