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# Article Review: Gingivitis, Etiology and Prevention

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**Abstract:** Since the maintenance of the structures that support the practice of dentistry is affected by gingivitis, in this article was reviewed the etiology points for gingivitis and prevention methods to avoid gingivitis disease.

**Keywords:** oral disease, normal gum, dental caries and periodontal disease.

**Introduction:** The disease is caused mostly by bacterial infections that resulting in an aggressor disorders in gum tissues. It is gingival inflammation with the tissue connection to the tooth maintaining its prior position, that is, not losing its. Only connective tissue, soft tissue of the gingival epithelium is affected by the illness. Gingivitis is concerned usually to periodontal infections. According to clinical signs, there are several form of gingivitis which varies based on etiology, severity and length of infection **(1-2).**

**1- Etiology**: Five different forms of gingivitis can be distinguished based on the etiology.

**1-1. Gingivitis Caused by Plaque:** The most common cause of the condition is dental plaque biofilm-induced gingivitis. It is described at the site level as "an inflammatory lesion resulting from interactions between the dental plaque biofilm and the host's immune-inflammatory response, which remains contained within the gingiva and does not extend to the periodontal attachment"**.** Such inflammation can be stopped since it only affects the gingiva and does not spread across the mucogingival junction when dental plaque levels are reduced at and apical to the gingival edge **(3-5).**

**1-2. Infectious Gingiviti**s: many of illness in the mouth, including tooth decay, might cause this type of gingivitis. Plasma cells may infiltrate the gingiva as a result of an allergic hypersensitivity reaction, leading to plasma cell gingivitis.gum chewing, certain toothpaste components, cinnamon, mint, and red pepper and other ingredients all these be allergens. Additionally, low-severity injuries of surrounding tissues, for instance broken teeth, obstructive restorations, excess flanges on a denture can result in infectious gingivitis **(6, 7).**

**1-3. Nutritional Gingivitis**: This could happen as a result of vitamin C insufficiency. It has been discovered that the inflammatory process can be aided by the modern lifestyle, which includes consuming having a higher proportion of fatty acids and more refined carbohydrates. The processes by which nutrient with a high glycemic index promote the inflammatory process are NFkB activation and oxidative damage **(8, 9).**

**1-4. Hormone affected on gingivitis:** The gingivitis develops as a result of steroids, puberty, or pregnancy. The literature has shown that there is a rise in the amount of women sex hormones during pregnancy, which is what causes pregnancy gingivitis **(10).** Even without the presence of plaque, gingival inflammation develops during adolescence. Puberty gingivitis is the medical term for this. It has been found that the cytoplasm of gingival cells contains estrogen and testosterone receptors with significant affinity for both hormones. This type of gingivitis develops as a result of steroids, puberty, or pregnancy. The research has shown that there is high quantity of circulating women sex hormones during pregnancy, which is what causes pregnancy gingivitis **(11).** Even without the presence of plaque, gingival inflammation develops during adolescence. Puberty gingivitis is the medical term for this. It has been discovered that estrogen and testosterone receptors with high affinities for these hormones exist in the gingival cells. Estrogen receptors are particularly present in the layers of the epithelium. Gingivitis is known to manifest in females (aged eleven to thirteen) before it does in boys during adolescence **(12, 13).**

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**1-5. Addiction-Related Gingivitis:** Gingivitis can be a side effect of several medications, including phenytoin (in epileptic seizures treatment), blockers calcium way (used in high blood pressure), medications that prevent clotting ,oral conceiving .Gingivitis then develops as a result of this. In addition to this, a number of risk factors might cause gingivitis. The patient's personal habits (smoking and chewing tobacco), systemic diseases (such as diabetes), genetics, and local circumstances (such as well as a dry mouth and a full mouth) are among these **(14-16).**

2- **Non-plaque-induced gingival diseases:** The numerous diverse periodontal tissue reactions observed can be explained by gingival lesions that are not caused by plaque. The clinical characteristics of gingival inflammation frequently differ from those of common plaque-associated gingival disorders. Fungal, bacterial, viral infections, hereditary conditions, mucocutaneous diseases are among the factors that contribute to non-plaque-induced gingival diseases (e.g., lichen planus). Other potential causes include medication allergies and trauma-related tooth brushing **(17, 18).**

3- **Difference between permanent and primary teeth of gingival tissues:** While in the primary dentition the inflammatory lesion occupies a narrower tissue section along the gingival epithelium, it is usually located at the free gingiva along the coronal surface of the permanent teeth. The junctional epithelium of the primary tooth gingiva is thicker than that of the permanent tooth. A junctional epithelium with a thicker layer may have less permeability to bacterial toxins in the epithelial structures **(19-21).**

4- **Chemotherapeutic / antimicrobial agents:** The primary home care practices of routine teeth brushing and cleaning should be considered as the foundation, with antimicrobial or chemical agents that reduce oral disease as a complement. Chemotherapeutic drugs may be beneficial for patients who are unable to manage mechanical cleaning or who are reluctant to do so. Mouthwash use, in addition to mechanical oral cleanliness, health education, and motivation, helped orthodontic patients maintain good dental health. By altering the composition of plaque in a way that prevents health from deteriorating into disease, chemotherapeutic drugs may serve as adjuncts in the prevention of gingivitis. An antimicrobial agent must reach the target and then maintain a sufficient concentration without being washed away by the gingival crevicular fluid in order to be successful in the eradication or decrease of subgingival plaque microorganisms. Antimicrobial and antiseptic substances can effectively inhibit the buildup of supragingival plaque despite the diluting effect of saliva. Chemotherapeutic drugs can be delivered by means of varnishes, toothpaste, and chewing gum **(22-24).**

5- **Prevention of periodontal diseases:** a multi-stage procedure made up of primary, secondary, and tertiary elements has been described as the prevention of periodontal disorders, including gingivitis and periodontitis. The notion of health promotion and protection measures is included in primary prevention, which focuses on preventing the onset of disease. These health promotion techniques include fluoridation and teaching people about mouth hygiene, with the goal of empowering them to take charge of and improve their own health. Dentistry has proven effective in several primary preventative areas in developed countries. Improvements in attitudes regarding the significance of dental hygiene and the availability of water supply with fluoride. By using early diagnosis and therapy to halt illness progression in its earliest stages, prevention of further sickness tries to reduce the effect of disease. The idea of tertiary disease prevention is centered on rehabilitating the functional constraints brought on by the disabilities experienced after severe disease, and it also covers issues like implants and fixing artificial teeth **(25-28).**

## Conclusion

Oral gingivitis is a condition that can be treated. There are numerous adjuncts that could be used to manage pathogenic oral plaque to stop or slow the progression of disease. To improve dental health and lessen gingivitis, however, appropriate behavioral modification is required. The key to good disease management continues to be the mechanical plaque control achieved by appropriate oral hygiene practices.

## References

1. Scapoli, L., Girardi, A., Palmieri, A., Martinelli, M., Cura, F., Lauritano, D., and Carinci, F. (2015). Quantitative analysis of periodontal pathogens in periodontitis and gingivitis. *J Biol Regul Homeost Agents*, *29*(3 Suppl 1), 101-10.

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2. Jeong, J. S., and Heo, S. M. (2022). Oral health care in the long COVID era: Focusing on the relationship between COVID-19 and periodontal disease. *대한치과의사협회지 제*, *60*(7), 436.
3. Perry, R., and Tutt, C. (2015). Periodontal disease in cats: Back to basics–with an eye on the future. *Journal of feline medicine and surgery*, *17*(1), 45-65.
4. Cairo, F. (2017). Periodontal plastic surgery of gingival recessions at single and multiple teeth. *Periodontology 2000*, *75*(1), 296-316.
5. Murakami, S., Mealey, B. L., Mariotti, A., and Chapple, I. L. (2018). Dental plaque–induced gingival conditions. *Journal of clinical periodontology*, *45*, S17-S27.
6. Groeger, S. E., and Meyle, J. (2015). Epithelial barrier and oral bacterial infection. *Periodontology 2000*, *69*(1), 46-67.
7. Malek, R., Gharibi, A., Khlil, N., and Kissa, J. (2017). Necrotizing ulcerative gingivitis. *Contemporary clinical dentistry*, *8*(3), 496.
8. Achmad, M. H., Adam, A. M., and Satria, A. (2016). A cross sectional study of nutritional status among a group of school children in relation with gingivitis and dental caries severity. *J Dentomaxillofac Sci*, *1*(3), 150-4.
9. Rathee, M., and Jain, P. (2022). Gingivitis. In *StatPearls*. StatPearls Publishing. PP: 289.
10. Jafri, Z., Bhardwaj, A., Sawai, M., and Sultan, N. (2015). Influence of female sex hormones on periodontium: A case series. *Journal of natural science, biology, and medicine*, *6*(Suppl 1), S146.
11. Kumar, P. S. (2013). Sex and the subgingival microbiome: do female sex steroids affect periodontal bacteria?. *Periodontology 2000*, *61*(1), 103-124.
12. Wu, M., Chen, S. W., and Jiang, S. Y. (2015). Relationship between gingival inflammation and pregnancy. *Mediators of inflammation*, *2015*.
13. Hosadurga, R., Althaf, M. N., Hegde, S., Rajesh, K. S., and Kumar, M. A. (2016). Influence of sex hormone levels on gingival enlargement in adolescent patients undergoing fixed orthodontic therapy: A pilot study. *Contemporary Clinical Dentistry*, *7*(4), 506.
14. Farook, F. F., M Nizam, M. N., and Alshammari, A. (2019). An update on the mechanisms of phenytoin induced gingival overgrowth. *The Open Dentistry Journal*, *13*(1).
15. Asadi-Pooya, A. A., Rostaminejad, M., Zeraatpisheh, Z., and Damabi, N. M. (2021). Cosmetic adverse effects of antiseizure medications; A systematic review. *Seizure*, *91*, 9-21.
16. Mawardi, H., Alsubhi, A., Salem, N., Alhadlaq, E., Dakhil, S., Zahran, M., and Elbadawi, L. (2021). Management of medication-induced gingival hyperplasia: a systematic review. *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, *131*(1), 62-72.
17. Holmstrup, P., Plemons, J., and Meyle, J. (2018). Non–plaque-induced gingival diseases. *Journal of clinical periodontology*, *45*, S28-S43.
18. De Falco, D., Della Vella, F., Scivetti, M., Suriano, C., De Benedittis, M., and Petruzzi, M. (2022). Non-Plaque Induced Diffuse Gingival Overgrowth: An Overview. *Applied Sciences*, *12*(8), 3731.
19. Moriya, Y., Obama, T., Aiuchi, T., Sugiyama, T., Endo, Y., Koide, Y., and Yamamoto, M. (2017). Quantitative proteomic analysis of gingival crevicular fluids from deciduous and permanent teeth. *Journal of Clinical Periodontology*, *44*(4), 353-362.
20. de Paula Barros, J. N., de Araújo, T. A. A., Soares, T. R. C., Lenzi, M. M., de Andrade Risso, P., Fidalgo, T. K. D. S., and Maia, L. C. (2019). Profiles of trauma in primary and permanent teeth of children and adolescents. *Journal of clinical pediatric dentistry*, *43*(1), 5-10.
21. Day, P. F., Flores, M. T., O'Connell, A. C., Abbott, P. V., Tsilingaridis, G., Fouad, A. F., and Levin, L. (2020). International Association of Dental Traumatology guidelines for the management of traumatic dental injuries: 3. Injuries in the primary dentition. *Dental Traumatology*, *36*(4), 343-359.
22. Peedikayil, F. C., Sreenivasan, P., and Narayanan, A. (2015). Effect of coconut oil in plaque related gingivitis—A preliminary report. *Nigerian medical journal: journal of the Nigeria Medical Association*, *56*(2), 143.
23. Indurkar, M. S., and Verma, R. (2016). Effect of ozonated oil and chlorhexidine gel on plaque induced gingivitis: A randomized control clinical trial. *Journal of Indian Society of Periodontology*, *20*(1), 32.

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24. Wang, C., Cheng, T., Li, X., and Jin, L. (2020). Metronidazole-treated Porphyromonas gingivalis persisters invade human gingival epithelial cells and perturb innate responses. *Antimicrobial agents and chemotherapy*, *64*(6), e02529-19.
25. Chapple, I. L., Van der Weijden, F., Doerfer, C., Herrera, D., Shapira, L., Polak, D., and Graziani, F. (2015). Primary prevention of periodontitis: managing gingivitis. *Journal of clinical periodontology*, *42*, S71-S76.
26. Tonetti, M. S., Eickholz, P., Loos, B. G., Papapanou, P., Van Der Velden, U., Armitage, G., and Suvan, J. E. (2015). Principles in prevention of periodontal diseases: consensus report of group 1 of the 11th European Workshop on Periodontology on effective prevention of periodontal and peri-implant diseases. *Journal of clinical periodontology*, *42*, S5-S11.
27. Duque, A. D., Malheiros, Z., Stewart, B., and Romanelli, H. J. (2020). Strategies for the prevention of periodontal disease and its impact on general health in Latin America. Section III: Prevention. *Brazilian Oral Research*, *34*.
28. Mann, J., Bernstein, Y., and Findler, M. (2020). Periodontal disease and its prevention, by traditional and new avenues. *Experimental and therapeutic medicine*, *19*(2), 1504-1506.