



## MINI REVIEW

# Gingivitis and its complications: safeguarding your oral and overall health

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### ABSTRACT

Gingivitis is a common gum disease caused by inflammation of the gum tissue, which can result in serious health issues if not addressed. This evaluation explores the different reasons for gingivitis development, such as insufficient oral care, smoking, hormonal changes, health conditions, lack of nutrients, and dry mouth. In a clinical setting, gingivitis is characterized by symptoms including redness, swelling, bleeding, halitosis, receding gums, and sensitivity. If not treated, it can advance to periodontitis, leading to tooth loss, abscess formation, and the emergence of systemic issues like cardiovascular disease, diabetes, respiratory infections, negative pregnancy outcomes, and stroke. In order to avoid and control gingivitis, it is essential to uphold proper oral care, have routine dental exams, stop smoking, adhere to a well-rounded diet, drink water regularly, and handle stress effectively. Professional interventions such as scaling, root planning, and antimicrobial treatments are necessary to handle current cases of gingivitis. This review highlights the significance of timely detection and intervention in stopping the advancement of gingivitis and lessening its wider health consequences. By focusing on the health of the gums, both dental professionals and patients can greatly decrease the frequency and severity of periodontal diseases, which in turn enhances overall health and quality of life.

### KEYWORDS

Gingivitis; Periodontal Disease; Oral Hygiene; Systemic Health; Inflammation

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## Introduction

Gingivitis, a common oral health issue, is an important indicator in dental treatment, frequently ignored in the midst of more severe dental problems. Gingivitis, also known as gum inflammation, is mainly triggered by the accumulation of plaque and is identified by redness, swelling, and bleeding [1,2]. Even if gingivitis appears harmless at first, it should be taken seriously because it can develop into more serious gum diseases like periodontitis if not treated [1,3]. Gingivitis occurs due to inadequate oral hygiene habits that lead to the build-up of plaque, a sticky bacterial film, along the gum line [4]. The toxins released by plaque bacteria can irritate gums and lead to the inflammation associated with gingivitis [5]. Insufficient brushing and flossing, infrequent dental check-ups, smoking, hormonal fluctuations (like in pregnancy), and specific medications can worsen the likelihood of experiencing this condition [6,7]. In addition to impacting oral health locally, gingivitis can also have significant consequences for overall health. Studies are showing a growing connection between untreated gum disease and various health problems such as heart disease, diabetes complications, respiratory infections, and negative pregnancy results [8,9]. This highlights how oral health is connected to overall systemic health, a concept known in dentistry as the oral-systemic health connection.

The key to controlling gingivitis and avoiding its complications is through prevention [10,11]. Developing and upholding proper oral hygiene routines is essential in preventive care. Consistent use of fluoride toothpaste for brushing, daily flossing, and the use of antiseptic mouthwashes can assist in eliminating plaque and decreasing gum inflammation. Equally important is to schedule regular dental exams, during which professionals can identify early signs of gingivitis and offer

timely treatments to prevent further development [10,11]. Treatment for gingivitis involves managing inflammation and removing plaque accumulation [12]. Dental professionals may suggest professional cleanings, scaling to eliminate hardened plaque (tartar), and root planning to even out rough areas on tooth roots where bacteria gather. Antibiotics or antimicrobial mouth rinses may be recommended for those with advanced gingivitis or at a higher risk to help fight bacterial infection and aid in gum healing [13].

Importantly, gingivitis holds importance beyond just clinical treatment; it requires a proactive approach to promoting oral health knowledge and empowering patients [14]. Knowledge about the indicators and origins of gingivitis gives people the ability to identify early signs and promptly seek help. Recognizing the connection between oral health and overall health promotes holistic health approaches, inspiring people to see dental care as crucial to their overall wellness [15].

This brief overview intends to thoroughly examine gingivitis, covering its causes and symptoms to its risks and treatment approaches. This review emphasizes the need for dental professionals and patients to prioritize gum health as a crucial part of overall well-being, by stressing the importance of early detection and intervention. Comprehending the intricacies of gingivitis and utilizing successful preventive and treatment methods can greatly decrease the impact of periodontal diseases and their related health risks.

## Understanding Gingivitis: Causes and Risk Factors

Gingivitis commonly arises from the buildup of bacterial plaque, which is a sticky, transparent film that develops on

teeth due to the interaction of sugars and starches with mouth bacteria. If plaque is not removed by brushing and flossing regularly, it can turn into tartar, making the gums more irritated and inflamed. Gingivitis, which is defined by inflammation of the gum tissue, is a prevalent periodontal disease that impacts people worldwide [16]. Even though it is common and often starts off mildly, gingivitis can result in serious dental and overall health issues if not properly addressed [16]. The development of gingivitis is mainly caused by the buildup of bacterial plaque on the teeth, leading to inflammation in the nearby gum tissue [16,17]. Although it can be reversed with good oral hygiene, this inflammatory issue can develop into periodontitis, a more serious gum disease that causes permanent damage to the structures supporting teeth, such as the alveolar bone and gingivitis has multiple causes [17-19].

Inadequate dental care continues to be the primary cause, as it leads to plaque buildup and the development of tartar, which provides a breeding ground for harmful bacteria [20]. Furthermore, lifestyle habits like smoking can greatly hinder the immune response and blood flow to the gums, worsening the situation [6,21]. Hormonal fluctuations in pregnancy, menstruation, and menopause can also heighten vulnerability to gum inflammation [7,22,23]. Moreover, health conditions like diabetes and compromised immune systems, such as HIV/AIDS, can worsen the likelihood and seriousness of gingivitis because the body's weakened ability to combat infections [24-26]. Vitamin C deficiency and dry mouth also play a role in the development and progression of the disease [27,28]. Recognizing these reasons and potential risks is essential in the prevention and treatment of gingivitis, emphasizing the significance of upholding proper oral care and dealing with any underlying health concerns for the best gum health.

### Identifying Gingivitis: Key Symptoms and Early Detection

Detecting gingivitis early is vital in preventing its advancement to more serious types of periodontal disease. Even though it may not show symptoms frequently, there are various typical indicators to be aware of which suggest the existence of gingivitis. Gums that are healthy look firm and pink, whereas they become red and swollen when they're inflamed [29,30]. Bleeding gums often accompany this inflammation and can happen suddenly while brushing or flossing. Chronic halitosis, also known as persistent bad breath, may indicate the presence of plaque accumulation and gingivitis, since bacteria in the plaque create compounds that cause unpleasant odors [31]. Another sign of gum disease is when the gums recede from the teeth, causing them to look longer. Moreover, gums can also become sore or sensitive when touched, indicating inflammation [32]. Identifying these signs soon and getting professional dental treatment can effectively control gingivitis and stop it from progressing to periodontitis, ensuring good oral health.

### The Progression and Complications of Gingivitis: From Gum Inflammation to Systemic Health Risks

Failure to treat gingivitis can lead to the development of periodontitis, a more serious type of gum disease. This process includes the extension of inflammation and infection to the structures that support the teeth, such as the bone [33]. Untreated gingivitis can lead to extensive and severe

complications [33]. Periodontitis is identified by the deterioration of the gum tissue and bones that support the teeth [22]. As the condition advances, cavities develop and become infected in the spaces between the gums and teeth. If left untreated, tooth loss can occur due to the immune system breaking down the bone and connective tissue that support teeth in response to infection and bacterial toxins [7]. Periodontitis, which is a leading reason for adult tooth loss, has a significant effect on quality of life [34]. Severe gum disease can result in the development of abscesses, which are painful accumulations of pus that may form in the gums or bone. Prompt treatment of dental abscesses involving drainage and antibiotics is necessary to stop the infection from spreading [35].

Several systemic conditions have been found to have a strong link with periodontal disease based on research findings [8,9]. Inflammation caused by gum disease may lead to cardiovascular issues, as oral bacteria can travel through the bloodstream and adhere to fatty deposits in the arteries, causing inflammation and raising the chances of a heart attack [8,9]. Gum disease can complicate blood sugar control for individuals with diabetes, leading to a harmful cycle where elevated blood sugar levels exacerbate gum disease. Bacteria present in the mouth can be breathed into the lungs, causing respiratory illnesses like pneumonia, especially in people with weakened immune systems [8,9]. Expectant mothers with periodontal disease have an increased likelihood of delivering prematurely and having a baby with low birth weight, as the inflammation and infection from gum disease can lead to negative effects on pregnancy outcomes [7]. Moreover, research has shown a link between periodontal disease and a higher chance of experiencing a stroke, potentially caused by systemic inflammation and the spread of bacteria [8,9]. Chronic inflammation and harmful bacteria from periodontal disease may result in strokes by causing plaques to accumulate in the arteries, potentially leading to ruptures or blood clots that obstruct blood flow to the brain. Additionally, individuals with diabetes are at a higher risk for infections, such as gum infections, and serious gum disease can impact blood sugar regulation, complicating diabetes care [11]. Successful gum disease management can enhance blood sugar levels and general well-being, stressing the significance of early detection and treatment of gingivitis to stop its advancement and related systemic issues.

### Prevention and Management of Gingivitis: Essential Practices for Healthy Gums

Effective prevention of gingivitis mainly revolves around upholding good oral hygiene practices [36,37]. This includes correctly brushing, utilizing a gentle-bristled toothbrush and fluoride toothpaste, and brushing at least two times per day to cover all tooth and gum areas [6]. It is advised to change the toothbrush every three to four months, or sooner if the bristles are worn out. Furthermore, it is crucial to floss every day to eliminate plaque and food debris from the spaces between teeth and below the gums that a toothbrush cannot access [38]. To prevent gum damage, floss gently with a back-and-forth sawing motion. Adding an antibacterial mouthwash to your daily routine can also assist in decreasing plaque buildup and avoiding gingivitis [39]. Regular dental appointments are crucial, as they include professional cleanings to eliminate tartar missed by brushing and flossing

and allow dentists to detect early signs of gingivitis, offering the necessary treatment [40]. Stopping smoking greatly decreases the chances of developing gum disease since tobacco use is a major contributing factor [41,42]. Eating a variety of fruits, vegetables, and whole grains promotes healthy gums, while limiting sugary foods and drinks that can lead to plaque formation [43]. Remaining well-hydrated aids in rinsing away food residue and germs, maintaining oral cleanliness, and lowering the chances of developing gum disease. Ultimately, it is crucial to control stress because it has the potential to compromise the immune system, thus increasing susceptibility to various infections such as gum disease [7,44]. Engaging in activities like working out, mindfulness, or pursuing interests can lower stress and promote well-being.

Those with gingivitis need to promptly seek professional treatment. Dental experts can carry out deep cleaning methods such as scaling and root planning to remove tartar and plaque from below the gum line [44]. These methods make the root surfaces smoother, making it more difficult for bacteria to stick and decreasing inflammation. Drugs can also be given to manage bacterial infections and inflammation. This comprehensive method effectively controls gingivitis and halts its advancement to more severe gum diseases. Combining proper oral hygiene habits with regular dental check-ups and lifestyle changes can help keep gums healthy and maintain overall oral health, thus avoiding the problems that come with untreated gingivitis. Timely treatment and regular attention are essential for controlling gingivitis and maintaining overall dental and systemic wellness.

### Conclusions

Gingivitis, a prevalent condition, requires significant focus because of its ability to advance to more serious gum diseases that can affect a person's overall health. Highlighting the significance of early intervention and prevention is essential. Taking good care of your teeth and gums with regular dental visits can prevent gingivitis and maintain gum health. Prioritizing oral care is crucial for overall health as it is necessary to maintain healthy gums. Implementing preventive strategies at this time can result in improved oral health and overall well-being in the future. Through developing positive oral practices, people can guarantee long-lasting health and energy.

### Disclosure statement

No potential conflict of interest was reported by the authors.

### References

1. Kinane DF, Stathopoulou PG, Papananou PN. Periodontal diseases. *Na Rev Dis Primers*. 2017;3(1):1-4. <https://doi.org/10.1038/nrdp.2017.38>
2. Lang NP, Schätzle MA, Löe H. Gingivitis as a risk factor in periodontal disease. *J Clin Periodontol*. 2009;36:3-8. <https://doi.org/10.1111/j.1600-051X.2009.01415.x>
3. Mythri S, Arunkumar SM, Hegde S, Rajesh SK, Munaz M, Ashwin D. Etiology and occurrence of gingival recession-An epidemiological study. *J Indian Soc Periodontol*. 2015;19(6):671-675. <https://doi.org/10.4103/0972-124X.156881>
4. Gibson MP, Tatakis DN. Treatment of gummy smile of multifactorial etiology: a case report. *Clin adv periodontics*. 2017;7(4):167-173. <https://doi.org/10.1902/cap.2017.160074>
5. McDonald RE, Avery DR, Weddell JA. Gingivitis and periodontal disease. *Dentistry for the child and adolescent ed*. 2010;9:366-402.
6. Knight ET, Liu J, Seymour GJ, Faggion Jr CM, Cullinan MP. Risk factors that may modify the innate and adaptive immune responses in periodontal diseases. *Periodontol* 2000. 2016;71(1):22-51. <https://doi.org/10.1111/prd.12110>
7. Loos BG, Van Dyke TE. The role of inflammation and genetics in periodontal disease. *Periodontol* 2000. 2020;83(1):26-39. <https://doi.org/10.1111/prd.12297>
8. Markou E, Eleana B, Lazaros T, Antonios K. The influence of sex steroid hormones on gingiva of women. *Open Dent J*. 2009;3:114. <https://doi.org/10.2174/2F1874210600903010114>
9. Sooriyamoorthy M, Gower DB. Hormonal influences on gingival tissue: relationship to periodontal disease. *J Clin Periodontol*. 1989;(4):201-208. <https://doi.org/10.1111/j.1600-051X.1989.tb01642.x>
10. Marcuschamer E, Hawley CE, Speckman I, Romero RM, Molina JN. A lifetime of normal hormonal events and their impact on periodontal Health. *Perinatol reprod Hum*. 2009;23(2):53-64.
11. Lim G, Janu U, Chiou LL, Gandhi KK, Palomo L, John V. Periodontal health and systemic conditions. *Dent J*. 2020;8(4):130 <https://doi.org/10.3390/dj8040130>
12. Ryder MI, Shiboski C, Yao TJ, Moscicki AB. Current trends and new developments in HIV research and periodontal diseases. *Periodontol* 2000. 2020;82(1):65-77. <https://doi.org/10.1111/prd.12321>
13. Tolkachjov SN, Bruce AJ. Oral manifestations of nutritional disorders. *Clin Dermatol*. 2017;35(5):441-452. <https://doi.org/10.1016/j.clindermatol.2017.06.009>
14. Nabeth E. Malnutrition and nutrient deficiencies: manifestations on oral health—narrative review (Doctoral dissertation). 2023. Available from: <http://hdl.handle.net/10284/12812>
15. Page RC. Gingivitis. *J Clin Periodontol*. 1986;13(5):345-355. <https://doi.org/10.1111/j.1600-051X.1986.tb01471.x>
16. Oredugba F, Ayanbadejo P. Gingivitis in children and adolescents. *Oral Health Care-Pediatric, Research, Epidemiology and Clinical Practices*. 2012:69-86.
17. Gasner NS, Schure RS. Periodontal disease. InStatPearls [Internet] 2023. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK554590/>
18. Tandellin RT, Saini R. Dental Plaque: A Biofilm and Challenges in Oral Health. PT Kanisius.
19. Marcano R, Rojo MÁ, Cordoba-Diaz D, Garrosa M. Pathological and therapeutic approach to endotoxin-secreting bacteria involved in periodontal disease. *Toxins*. 2021;13(8):533. <https://doi.org/10.3390/toxins13080533>
20. Kalhan AC, Wong ML, Allen F, Gao X. Periodontal disease and systemic health: An update for medical practitioners. *Ann Acad Med Singap*. 2022;51(9):567-574. <https://doi.org/10.47102/annals-acadmedsg.2021503>
21. Genco RJ, Sanz M. Clinical and public health implications of periodontal and systemic diseases: An overview. *Periodontol* 2000. 2020;83(1):7-13. <https://doi.org/10.1111/prd.12344>
22. Birch S, Bridgman C, Brocklehurst P, Ellwood R, Gomez J, Helgeson M, et al. Prevention in practice—a summary. *BMC Oral Health*. 2015;15:1-9. <https://doi.org/10.1186/1472-6831-15-S1-S12>
23. Nazir MA, AlGhamdi L, AlKadi M, AlBeajan N, AlRashoudi L, AlHussan M. The burden of diabetes, its oral complications and their prevention and management. *Open Access Maced J Med Sci*. 2018;6(8):1545-1553. <https://doi.org/10.3889/2Ffoamjms.2018.294>
24. Öhrn K, Sanz M. Prevention and therapeutic approaches to gingival inflammation. *J Clin Periodontol*. 2009;36:20-26.
25. Alassy H, Pizarek JA, Kormas I, Pedercini A, Wolff LF. Antimicrobial adjuncts in the management of periodontal and peri-implant diseases and conditions: A narrative review. *Front Oral Maxillofac Med*. 2021;3. <https://fomm.amegroups.org/article/view/51570>
26. Cota LO, Villar CC, Vettore MV, Campos JR, Amaral GC, Cortelli JR, et al. Periodontal diseases: is it possible to prevent them? A populational and individual approach. *Braz Oral Res*. 2021;35(2):e098. <https://doi.org/10.1590/1807-3107bor-2021.vol35.0098>
27. Fisher J, Berman R, Buse K, Doll B, Glick M, Metz J, et al. Achieving oral health for all through public health approaches, interprofessional, and transdisciplinary education. *NAM*

- perspectives. 2023;2023. <https://doi.org/10.31478/202302b>
28. Essex G, Perry DA. Gingival Diseases. *Periodontology for the Dental Hygienist-E-Book*. 2015;15:70.
29. Solanki G. A general overview of gingiva. *Int J Biomed Res.* 2012;3(02):79-82.
30. Nachnani S. Oral malodor: causes, assessment, and treatment. *Compend Contin Educ Dent.* 2011;32(1).
31. Gu Y, Ryan ME. Overview of periodontal disease: causes, pathogenesis, and characteristics. *Periodontal disease and overall health: a clinician's guide*. 2010:5.
32. Ray RR. Periodontitis: an oral disease with severe consequences. *Biotechnol Appl Biochem.* 2023;195(1):17-32. <https://doi.org/10.1007/s12010-022-04127-9>
33. Ferreira MC, Dias-Pereira AC, Branco-de-Almeida LS, Martins CC, Paiva SM. Impact of periodontal disease on quality of life: a systematic review. *J Periodontal Res.* 2017;52(4):651-665. <https://doi.org/10.1111/jre.12436>
34. Herrera D, Alonso B, de Arriba L, Santa Cruz I, Serrano C, Sanz M. Acute periodontal lesions. *Periodontol 2000.* 2014;65(1):149-177. <https://doi.org/10.1111/prd.12022>
35. Watt R, Marinho V. Does oral health promotion improve oral hygiene and gingival health?. *Periodontol 2000.* 2005;37(1).
36. Sälzer S, Graetz C, Dörfer CE, Slot DE, Van der Weijden FA. Contemporary practices for mechanical oral hygiene to prevent periodontal disease. *Periodontol 2000.* 2020;84(1):35-44. <https://doi.org/10.1111/prd.12332>
37. Iba B, Adamu VE. Tooth brushing: An effective oral hygiene measure. *Orap J.* 2021 31;2(2):e811.
38. Rajendiran M, Trivedi HM, Chen D, Gajendrareddy P, Chen L. Recent development of active ingredients in mouthwashes and toothpastes for periodontal diseases. *Molecules.* 2021;26(7):2001. <https://doi.org/10.3390/molecules26072001>
39. Reynolds S. The Crucial Role of Regular Dental Check-ups and Cleanings in Maintaining Oral Health: A Comprehensive Review. 2024
40. Winn DM. Tobacco use and oral disease. *J Dent Educ.* 2001;65(4):306-312. <https://doi.org/10.1002/j.0022-0337.2001.65.4.tb03400.x>
41. Warnakulasuriya S, Dietrich T, Bornstein MM, Peidró EC, Preshaw PM, Walter C, et al. Oral health risks of tobacco use and effects of cessation. *Int Dent J.* 2010;60(1):7-30. [https://doi.org/10.1922/IDJ\\_2532Warnakulasuriya24](https://doi.org/10.1922/IDJ_2532Warnakulasuriya24)
42. Phillips E. Mouth Care Comes Clean: Breakthrough Strategies to Stop Cavities and Heal Gum Disease Naturally. Greenleaf Book Group; 2018.
43. Martínez M, Postolache TT, García-Bueno B, Leza JC, Figuero E, Lowry CA, et al. The role of the oral microbiota related to periodontal diseases in anxiety, mood and trauma-and stress-related disorders. *Front Psychiatry.* 2022;12:814177. Available from: <https://www.frontiersin.org/journals/psychiatry/articles/10.3389/fpsy.2021.814177>
44. Hollins C. Basic guide to dental procedures. John Wiley & Sons; 2024.