World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(REVIEW ARTICLE)

The Impact of Sialadenitis on Salivary Function and Tooth Enamel Health: A Literature Review

Thalisa Sarah Nadina *, Clarisa Amelia S and Athallah Achmad Zaki

Dental Medicine Program, Faculty of Dentistry, Airlangga University Surabaya, Indonesia.

World Journal of Advanced Research and Reviews, 2026, 29(01), 886-889

Publication history: Received on 03 December 2025; revised on 14 January 2026; accepted on 16 January 2026

Article DOI: https://doi.org/10.30574/wjarr.2026.29.1.0120

Abstract

Saliva plays a vital role in maintaining oral health by protecting tooth enamel through its buffering capacity, antimicrobial activity, and remineralization potential. Disruption of salivary function may compromise these protective mechanisms and increase the risk of enamel demineralization and dental disease. This study aims to review and analyze the impact of sialadenitis on salivary function and its implications for enamel integrity and overall dental health. A narrative literature review was conducted using scientific articles and textbooks published between 2014 and 2020, obtained from electronic databases including Google Scholar, Garuda, and SINTA. The selected literature focused on salivary physiology, the pathogenesis of sialadenitis, enamel structure, and the relationship between salivary dysfunction and oral health outcomes. The analysis revealed that sialadenitis is associated with reduced salivary flow, xerostomia, and altered saliva composition, leading to diminished buffering and antimicrobial capacity. These changes promote prolonged acidic conditions in the oral cavity, increasing the risk of enamel demineralization, dental caries, and secondary oral infections. Chronic or recurrent sialadenitis further exacerbates salivary hypofunction, particularly in elderly individuals and patients with systemic diseases, thereby accelerating enamel deterioration and negatively affecting oral health. In conclusion, sialadenitis indirectly but significantly influences enamel health through its adverse effects on salivary quantity and quality, highlighting the importance of early diagnosis, appropriate management, and preventive oral care strategies to preserve enamel integrity and maintain optimal oral health.

Keywords: Saliva; Sialadenitis; Tooth Enamel; Xerostomia; Oral Health; Salivary Gland Infection

1. Introduction

Saliva plays a fundamental role in maintaining oral homeostasis and preserving dental hard tissues. As a complex biological fluid secreted by major and minor salivary glands, saliva contributes to multiple protective mechanisms within the oral cavity, including mechanical cleansing, buffering capacity, antimicrobial activity, and remineralization of tooth enamel [1, 2]. The quantity and quality of saliva are therefore critical determinants of oral health, influencing susceptibility to dental caries, enamel erosion, and oral infections [3, 4].

Tooth enamel, the outermost and hardest tissue of the human body, is primarily composed of hydroxyapatite crystals and serves as the first line of defense against mechanical, chemical, and microbial challenges [1]. Despite its high mineral content and structural strength, enamel is susceptible to demineralization when exposed to acidic environments and reduced salivary protection [5, 6]. Persistent alterations in salivary flow, composition, and pH may disrupt the balance between demineralization and remineralization, leading to progressive enamel wear, dentin exposure, and increased dental sensitivity [7, 8].

Sialadenitis is an inflammatory condition of the salivary glands that may significantly impair normal salivary function. This condition can involve major salivary glands such as the parotid, submandibular, and sublingual glands, as well as

* Corresponding author: Thalisa Sarah Nadina

minor salivary glands distributed throughout the oral mucosa. Sialadenitis may result from infectious causes most commonly bacterial pathogens such as Staphylococcus aureus and Streptococcus species or from non-infectious factors including ductal obstruction, autoimmune disorders, dehydration, and systemic diseases [9, 10].

Clinically, sialadenitis is often associated with glandular swelling, pain, xerostomia, and reduced salivary secretion [10]. A decrease in salivary flow compromises the oral cavity's natural defense mechanisms, including buffering capacity and antimicrobial activity, thereby facilitating acidogenic bacterial growth and prolonged acidic conditions on the tooth surface [1, 2]. As a result, enamel integrity may be adversely affected, increasing the risk of enamel demineralization, dental caries, and secondary oral infections [3, 6].

Furthermore, chronic inflammation of the salivary glands may exacerbate salivary hypofunction, particularly in elderly individuals and patients with systemic diseases or long-term medication use [2, 4]. Reduced salivary protection not only predisposes individuals to enamel damage but also negatively impacts overall oral health and quality of life [3].

Despite the established importance of saliva in maintaining enamel integrity, the specific relationship between sialadenitis-related salivary dysfunction and enamel health remains insufficiently discussed in the literature. A comprehensive understanding of how sialadenitis affects salivary function and subsequently compromises enamel integrity is essential for improving preventive strategies and clinical management in dental practice. Therefore, this literature review aims to analyze and synthesize available evidence regarding the impact of sialadenitis on saliva and its implications for enamel health and overall oral condition.

2. Material and methods

2.1. Study Design

This study was conducted as a narrative literature review aimed at analyzing and synthesizing existing evidence regarding the impact of sialadenitis on salivary function and its implications for tooth enamel health. A literature review approach was selected to comprehensively evaluate published findings related to salivary gland inflammation, salivary dysfunction, and enamel integrity.

2.2. Data Sources and Search Strategy

Relevant literature was identified through electronic database searches, including Google Scholar, Garuda, and SINTA. The search was conducted using combinations of keywords such as saliva, sialadenitis, salivary gland infection, xerostomia, tooth enamel, and oral health. Boolean operators ("AND", "OR") were applied to refine the search and ensure comprehensive coverage of the topic. Manual searching of reference lists from relevant articles was also performed to identify additional eligible sources.

2.3. Eligibility Criteria

The inclusion criteria consisted of scientific articles and textbooks published between 2014 and 2020 that discussed salivary physiology, sialadenitis, salivary gland disorders, enamel structure, or the relationship between salivary dysfunction and oral health. Both clinical and review-based studies were considered. Articles written in English or Indonesian and available in full text were included. Exclusion criteria comprised publications outside the defined publication period, articles lacking relevance to the study objectives, duplicate publications, and sources without accessible full texts.

2.4. Study Selection Process

All identified articles were initially screened based on their titles and abstracts to assess relevance. Subsequently, full-text screening was conducted to determine eligibility according to the inclusion and exclusion criteria. Studies that met the predefined criteria were selected for qualitative synthesis.

2.5. Data Extraction and Analysis

Data were extracted systematically from the selected literature, focusing on study characteristics, etiology and pathophysiology of sialadenitis, effects on salivary flow and composition, and reported outcomes related to enamel health and oral conditions. The extracted information was analyzed descriptively and synthesized narratively to identify consistent patterns, mechanisms, and clinical implications linking sialadenitis-related salivary dysfunction to enamel integrity.

3. Results and discussion

3.1. Effects of Sialadenitis on Salivary Function

Based on the reviewed literature, sialadenitis is consistently associated with impaired salivary gland function, primarily characterized by a reduction in salivary flow and qualitative alterations in saliva composition [9, 10]. Inflammatory processes within the salivary glands disrupt normal secretory mechanisms, leading to xerostomia and decreased production of essential salivary components, including enzymes, immunoglobulins, and antimicrobial proteins [1, 2]. These changes weaken the oral cavity's natural defense system and increase susceptibility to microbial colonization.

Both acute and chronic forms of sialadenitis have been reported to contribute to salivary hypofunction. Acute bacterial sialadenitis often presents with rapid glandular swelling, pain, and a sudden decrease in salivary secretion, whereas chronic sialadenitis may result in persistent inflammation, fibrosis, and gradual loss of functional glandular tissue [9, 10]. The impact of salivary dysfunction is more pronounced in elderly individuals and patients with systemic diseases, dehydration, or long-term medication use, all of which further exacerbate salivary hyposecretion [2, 4].

3.2. Impact of Salivary Dysfunction on Enamel Integrity

Salivary hypofunction resulting from sialadenitis has important consequences for tooth enamel integrity. Saliva plays a critical role in buffering acids within the oral cavity and facilitating enamel remineralization [1]. A reduction in salivary flow diminishes buffering capacity, allowing acidic conditions to persist longer on the enamel surface and accelerating demineralization processes [5, 8].

Furthermore, alterations in saliva composition reduce the availability of calcium, phosphate, and fluoride ions required for enamel remineralization, while the decrease in salivary proteins compromises the formation of the acquired pellicle that normally protects enamel from acid attacks [1]. As a result, enamel becomes more vulnerable to erosion, dentin exposure, tooth sensitivity, and increased caries risk [6, 7].

3.3. Clinical Implications for Oral Health

The interaction between sialadenitis, salivary dysfunction, and enamel damage has significant clinical implications. Reduced salivary protection promotes the proliferation of acidogenic bacteria, thereby increasing the risk of dental caries and periodontal disease [7, 8]. Xerostomia associated with sialadenitis also negatively affects mastication, swallowing, and oral comfort, potentially leading to nutritional problems and reduced oral health–related quality of life [3].

In addition, pain and swelling associated with sialadenitis may radiate to adjacent oral structures, including teeth, resulting in discomfort during chewing and oral function [9]. Antibiotic therapy used in bacterial sialadenitis may alter the oral microbial balance, which can further influence oral health conditions if not properly managed [3].

3.4. Discussion and Research Implications

The findings of this review indicate that sialadenitis should not be regarded solely as a localized salivary gland disorder but rather as a condition with broader implications for oral and dental health. The literature demonstrates that inflammation of the salivary glands indirectly compromises enamel integrity through reductions in salivary quantity and quality [1, 9]. Although enamel is not directly infected, the altered oral environment caused by salivary dysfunction accelerates enamel demineralization and increases vulnerability to dental disease [6].

However, most available studies emphasize clinical manifestations of salivary dysfunction rather than providing quantitative measurements of enamel loss. This highlights a gap in the literature and underscores the need for future studies employing standardized enamel assessment methods and longitudinal designs to better elucidate the relationship between sialadenitis severity and enamel deterioration [2, 10].

4. Conclusion

Sialadenitis affects oral health by impairing salivary gland function, leading to reduced salivary flow and altered saliva composition. This condition compromises the protective role of saliva in maintaining enamel integrity, thereby increasing the risk of enamel demineralization, dental caries, and other oral health problems. Salivary hypofunction associated with sialadenitis highlights the importance of early diagnosis, appropriate management, and preventive oral care to preserve enamel health and maintain optimal oral conditions.

Compliance with ethical standards

Acknowledgements

The authors would like to express their gratitude to the Faculty of Dental Medicine, Universitas Airlangga, for their support during this research.

Disclosure of conflict of interest

The authors declare that there is no conflict of interest.

References

[1] Hidayat R, Tandiari A. *Kesehatan gigi dan mulut: Apa yang sebaiknya Anda tahu?* Yogyakarta: Andi; 2016.

[2] Widya T. Xerostomia pada lansia [doctoral dissertation]. Tanjungkarang: Poltekkes Tanjungkarang; 2022.

[3] Manurung AKW, Wibisono G. Pengaruh xerostomia terhadap kesehatan gigi dan mulut terkait kualitas hidup pada usia lanjut. *Jurnal Kedokteran Diponegoro*. 2012;1(1).

[4] Arsyad A. Pengaruh xerostomia terhadap kesehatan gigi dan mulut terkait kualitas hidup pada usia lanjut di Desa Bapangi Kabupaten Sidrap. *Media Kesehatan Gigi*. 2017;16(2).

[5] Shellis RP, Featherstone JDB, Lussi A. Understanding the chemistry of dental erosion. *Monographs in Oral Science*. 2014;25:163–179.

[6] Schlueter N, Luka B. Erosive tooth wear: a review on global prevalence and on its prevalence in risk groups. *British Dental Journal*. 2018 Mar;224(5):364–370.

[7] Lussi A, Carvalho TS. Erosive tooth wear: a multifactorial condition of growing concern and increasing knowledge. *Monographs in Oral Science*. 2014;25:1–15.

[8] Zero DT, Lussi A. Erosion: chemical and biological factors of importance to the dental practitioner. *International Dental Journal*. 2005 Aug;55(Suppl 4):285–290.

[9] Djohan WH, Sapto H. Diagnosis dan penatalaksanaan sialadenitis bakteri. *JIMKI: Jurnal Ilmiah Mahasiswa Kedokteran Indonesia*. 2020 Aug 22;8(2):136–145.

[10] Utama SE. Imunopatogenesis sialadenitis pada penderita sindroma Sjögren dan gejala klinisnya (studi pustaka) [doctoral dissertation]. Jakarta: Fakultas Kedokteran Gigi, Universitas Trisakti; 2019.