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ALTERAÇÕES DAS MUCOSAS ORAIS EM IDOSOS: DISTINGUINDO O ENVELHECIMENTO FISIOLÓGICO, MODIFICADORES LOCAIS E DOENÇA SISTÊMICA DA MUCOSA ORAL

ALTERATIONS IN OLDER ADULTS: DISTINGUISHING PHYSIOLOGICAL AGING, LOCAL MODIFIERS, AND SYSTEMIC DISEASE

CAMBIOS MUCOSAS ORALES EN PERSONAS MAYORES: DISTINGUIENDO EL ENVEJECIMIENTO FISIOLÓGICO, MODIFICADORES LOCALES Y ENFERMEDADES SISTÉMICAS MUCOSAS ORALES

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Resumo

Alterações da mucosa oral são frequentemente observadas em adultos mais velhos, mas sua interpretação permanece desafiadora porque o envelhecimento cronológico, exposições locais, uso de medicamentos, condições sistêmicas e doenças orais definidas podem coexistir. Esta revisão narrativa, fundamentada em uma busca estruturada da literatura, teve como objetivo distinguir alterações relacionadas ao envelhecimento fisiológico de modificadores locais e sistêmicos e de achados clínicos que requerem investigação diagnóstica adicional. As evidências foram sintetizadas em domínios complementares, incluindo envelhecimento da mucosa oral, disfunção salivar, modificadores locais, exposição a medicamentos, conceitos relacionados à fragilidade, contexto sistêmico e nutricional, distúrbios imunomediados e sinais de alerta diagnósticos. A literatura disponível não sustenta um fenótipo uniforme da mucosa determinado apenas pela idade cronológica, nem fornece critérios diagnósticos validados para a “fragilidade da mucosa oral” como uma entidade distinta. Fatores locais, como trauma mecânico, próteses removíveis, infecção por Candida e alterações no ambiente salivar, podem influenciar substancialmente a aparência da mucosa. A exposição a medicamentos e as condições sistêmicas podem modificar ainda mais a homeostase tecidual, mas achados inespecíficos não devem ser interpretados como biomarcadores validados de

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fragilidade ou vulnerabilidade sistêmica. Lesões persistentes, progressivas, erosivas, descamativas, vesicobolhosas, multifocais ou de outra forma inexplicadas requerem um diagnóstico diferencial mais amplo e uma investigação orientada por hipóteses. O modelo proposto é uma síntese conceitual derivada dos autores, destinada a apoiar o raciocínio clínico, e não um algoritmo diagnóstico validado. Uma interpretação estruturada dos achados da mucosa oral pode ajudar os clínicos a evitar tanto a normalização excessiva de alterações patológicas quanto a atribuição prematura de alterações inespecíficas a doenças sistêmicas.

Palavras-chave: Mucosa Oral; Envelhecimento; Adultos Mais Velhos; Xerostomia; Fragilidade Oral; Medicina Oral.

Abstract

Oral mucosal alterations are frequently encountered in older adults, yet their interpretation remains challenging because chronological aging, local exposures, medication use, systemic conditions, and defined oral diseases may coexist. This narrative review, informed by a structured literature search, aimed to distinguish physiological aging-related changes from local and systemic modifiers and from clinical findings that warrant further diagnostic investigation. The evidence was synthesized across complementary domains including oral mucosal aging, salivary dysfunction, local modifiers, medication exposure, frailty-related concepts, systemic and nutritional context, immune-mediated disorders, and diagnostic red flags. The available literature does not support a uniform mucosal phenotype determined by chronological age alone, nor does it provide validated diagnostic criteria for “oral mucosal fragility” as a distinct entity. Local factors such as mechanical trauma, removable prostheses, candidal infection, and alterations in the salivary environment may substantially influence mucosal appearance. Medication exposure and systemic conditions may further modify tissue homeostasis, but nonspecific findings should not be interpreted as validated biomarkers of frailty or systemic vulnerability. Persistent, progressive, erosive, desquamative, vesiculobullous, multifocal, or otherwise unexplained lesions require a broader differential diagnosis and hypothesis-driven investigation. The proposed framework is an author-derived conceptual synthesis intended to support clinical reasoning rather than a validated diagnostic algorithm. A structured interpretation of oral mucosal findings may help clinicians avoid both excessive normalization of pathological changes and premature attribution of nonspecific alterations to systemic disease.

Keywords: Oral Mucosa; Aging; Older Adults; Xerostomia; Oral Frailty; Oral Medicine

Resumen

Las alteraciones de la mucosa oral se observan con frecuencia en adultos mayores, pero su interpretación sigue siendo un desafío debido a que el envejecimiento cronológico, las exposiciones locales, el uso de medicamentos, las condiciones sistémicas y las enfermedades orales definidas

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pueden coexistir. Esta revisión narrativa, basada en una búsqueda estructurada de la literatura, tuvo como objetivo distinguir los cambios relacionados con el envejecimiento fisiológico de los modificadores locales y sistémicos y de los hallazgos clínicos que requieren una investigación diagnóstica adicional. La evidencia se sintetizó en dominios complementarios que incluyeron el envejecimiento de la mucosa oral, la disfunción salival, los modificadores locales, la exposición a medicamentos, los conceptos relacionados con la fragilidad, el contexto sistémico y nutricional, los trastornos inmunomediados y las señales de alerta diagnósticas. La literatura disponible no respalda un fenotipo uniforme de la mucosa determinado únicamente por la edad cronológica, ni proporciona criterios diagnósticos validados para la "fragilidad de la mucosa oral" como una entidad diferenciada. Factores locales, como el traumatismo mecánico, las prótesis removibles, la infección por Candida y las alteraciones del entorno salival, pueden influir sustancialmente en el aspecto de la mucosa. La exposición a medicamentos y las condiciones sistémicas pueden modificar aún más la homeostasis tisular, pero los hallazgos inespecíficos no deben interpretarse como biomarcadores validados de fragilidad o vulnerabilidad sistémica. Las lesiones persistentes, progresivas, erosivas, descamativas, vesiculoampollosas, multifocales o inexplicables requieren un diagnóstico diferencial más amplio y una investigación orientada por hipótesis. El marco propuesto es una síntesis conceptual derivada de los autores, destinada a apoyar el razonamiento clínico y no constituye un algoritmo diagnóstico validado. Una interpretación estructurada de los hallazgos de la mucosa oral puede ayudar a los clínicos a evitar tanto la normalización excesiva de los cambios patológicos como la atribución prematura de alteraciones inespecíficas a enfermedades sistémicas.

Palabras clave: Mucosa Oral; Envejecimiento; Adultos Mayores; Xerostomía; Fragilidad Oral; Medicina Oral.

1. Introduction

Population aging has increased the clinical complexity of dental care and expanded the need to interpret oral findings within broader biological and clinical contexts. Older adults may present with multimorbidity, chronic medication exposure, functional limitations, and local oral conditions that interact with the appearance and behavior of oral tissues. [1–5]

Biological aging is heterogeneous and affects tissues through multiple mechanisms, including changes in cellular homeostasis, regenerative capacity, immune function, and extracellular matrix organization.[1] The oral mucosa is not a uniform tissue: masticatory, lining, and specialized mucosa differ structurally and

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functionally, limiting generalized assumptions about age-related changes.[2] Moreover, chronological age alone may not predict a consistent deterioration in the clinical appearance of the oral mucosa in otherwise healthy individuals.[3]

This distinction is clinically important because nonspecific findings may be overinterpreted in two opposite directions. They may be normalized as inevitable consequences of aging, delaying recognition of disease, or they may be prematurely interpreted as indicators of systemic compromise. Local trauma, prosthetic factors, candidal infection, salivary dysfunction, medications, and systemic disease may all influence oral mucosal integrity and appearance.[4,5]

Concepts such as frailty, multimorbidity, physiological reserve, and oral frailty also require careful separation. Oral frailty is primarily a functional construct and should not be considered synonymous with clinically apparent mucosal alterations.[6] Likewise, the expression “oral mucosal fragility” is not supported by validated diagnostic criteria as a distinct clinical entity.

Therefore, this review aimed to synthesize the available evidence relevant to the interpretation of oral mucosal alterations in older adults and to distinguish physiological aging, local modifiers, systemic and medication-related context, and clinical red flags suggesting disease beyond physiological aging.

2. Literature review

This study was conducted as a narrative review informed by a structured literature search. The objective was to provide a conceptually organized synthesis of evidence relevant to clinical interpretation rather than to perform a systematic review or meta-analysis.

Electronic searches were conducted in PubMed/MEDLINE, Scopus, and Web of Science. The search process was organized around eight complementary conceptual domains: (1) physiological aging of the oral mucosa; (2) xerostomia and hyposalivation; (3) local modifiers of mucosal integrity; (4) medication exposure and polypharmacy; (5) frailty, multimorbidity, and physiological reserve; (6) systemic and nutritional modifiers; (7) immune-mediated and vesiculobullous disorders; and (8) diagnostic red flags and further investigation. Search terms were adapted to the

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syntax of each database and combined controlled vocabulary, when available, with free-text terms.

Literature was selected for relevance to the conceptual domains of the review and to the clinical interpretation of oral mucosal findings in older adults. Priority was given to systematic reviews and meta-analyses, consensus statements, clinically relevant original studies, and authoritative reviews addressing diagnostic pathways. Evidence was interpreted according to its scope and limitations; heterogeneous evidence types were not treated as equivalent levels of proof. No formal risk-of-bias instrument was applied because the included literature served complementary conceptual and clinical purposes. The SANRA instrument was not used as a generic quality-assessment tool.

The review does not claim systematic-study identification, duplicate screening, or quantitative evidence synthesis. Accordingly, the proposed clinical framework should be interpreted as an author-derived conceptual synthesis informed by the reviewed literature.

Physiological Aging of the Oral Mucosa

Aging affects oral tissues through heterogeneous biological processes rather than through a single, uniform pathway. Changes in cellular homeostasis, tissue turnover, immune regulation, and extracellular matrix organization may occur with advancing age, but their magnitude and clinical expression vary substantially among individuals.[1]

Anatomical site also matters. The oral cavity contains distinct mucosal tissues with different keratinization patterns, connective tissue organization, mechanical demands, and exposure to local irritants.[2] Consequently, observations derived from one site should not automatically be generalized to the entire oral cavity.

Importantly, structural or histological differences do not necessarily translate into a predictable clinical phenotype. Evidence from healthy individuals indicates that chronological age alone does not necessarily produce a consistent deterioration in the visible appearance of the oral mucosa.[3] Therefore, an older patient's age should provide clinical context rather than function as a diagnostic explanation for a specific

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mucosal finding.

The term “oral mucosal fragility” may be useful descriptively when clinicians encounter tissue that appears delicate or is easily traumatized; however, the current literature does not provide validated diagnostic criteria for this expression as a distinct clinical entity. It should not be interpreted as a diagnosis, a biomarker, or a proxy for frailty.

Local Modifiers of Oral Mucosal Integrity

Local conditions may substantially influence the appearance and clinical behavior of the oral mucosa and should be assessed before nonspecific findings are attributed to aging or systemic disease.[4] Mechanical trauma, friction, sharp dental surfaces, removable prostheses, local irritants, oral hygiene practices, tobacco exposure, and infection may contribute to erythema, soreness, epithelial disruption, or persistent irritation.

The salivary environment is another important modifier. Xerostomia refers to the subjective sensation of oral dryness, whereas hyposalivation refers to objectively reduced salivary flow.[4,5] These conditions may coexist but are not interchangeable. Alterations in salivary quantity or quality may affect lubrication, comfort, microbial ecology, and susceptibility to local irritation.

In older adults, oral mucosal lesions have been associated with salivary secretion, systemic conditions, medications, and prosthetic factors.[4] When compatible clinical findings are present, candidal infection and denture-associated inflammation should also be considered. Local causes are particularly important because many are potentially reversible or modifiable.

Thus, clinical interpretation should begin with lesion characterization and assessment of local exposures. The presence of an apparently delicate mucosa does not, by itself, establish systemic disease.

Systemic and Medication-Related Modifiers

Systemic context can influence oral tissue homeostasis, but associations should be interpreted cautiously. Multimorbidity may increase the complexity of oral

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healthcare, and medication exposure may modify salivary function or the oral environment.[4,5] Several medications associated with dry mouth are frequently used by older adults, making medication review clinically relevant when symptoms or signs of oral dryness are present.[5]

Polypharmacy should not be treated as a diagnosis or as an automatic explanation for a particular mucosal lesion. Its relevance depends on the specific medications used, the patient's symptoms, dose and duration of exposure, coexisting conditions, and other local factors.

Frailty, multimorbidity, physiological reserve, and oral frailty represent distinct constructs. Oral frailty primarily concerns accumulated declines in oral function and should not be equated with visible mucosal alterations.[6] Similarly, nonspecific mucosal findings should not be considered validated biomarkers of systemic vulnerability.

Nutritional compromise and hematological abnormalities may be relevant when the clinical presentation suggests a specific underlying disorder. However, nonspecific mucosal findings alone should not be interpreted as evidence of nutritional deficiency or hematological disease. Laboratory investigation should therefore be guided by the diagnostic hypothesis rather than requested routinely because the mucosa appears delicate.

Red Flags Suggesting Disease Beyond Physiological Aging

Persistent or progressive lesions require particular attention because they may reflect processes that cannot be explained by physiological aging alone. Desquamation is a clinical finding rather than a diagnosis, and its differential diagnosis may include inflammatory, infectious, traumatic, and immune-mediated disorders.[7,8]

Persistent erosive or desquamative lesions, recurrent ulceration, vesicles or bullae, unexplained bleeding, multifocal involvement, delayed healing, progressive symptoms, and associated extraoral or systemic manifestations should prompt broader diagnostic reasoning.[7–10] The differential diagnosis should be determined by morphology, distribution, chronology, symptoms, relevant exposures, and the

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patient's medical history.

Immune-mediated disorders may require specific diagnostic procedures. When clinically indicated, investigation may include biopsy, histopathological examination, and direct immunofluorescence.[9] Appropriate biopsy-site selection is particularly important when immunobullous disease is suspected.

The Nikolsky sign should not be inferred solely from nonspecific epithelial detachment during manipulation. Mechanical trauma or pre-existing epithelial compromise may also produce tissue separation, and clinical interpretation must remain disease-specific.

Clinical Framework for Interpretation

The evidence reviewed supports a sequential approach to the interpretation of oral mucosal alterations in older adults. First, the clinician should characterize the finding according to site, morphology, extent, symptoms, duration, progression, and response to removal of potential irritants. Second, potentially reversible local modifiers should be assessed. Third, systemic and medication-related context should be considered. Finally, clinical red flags should determine whether further investigation or referral is warranted.

This framework is intended to assist clinical reasoning and is not presented as a validated diagnostic instrument. It is designed to reduce two common errors: assuming that a pathological lesion is merely age-related and assuming that every nonspecific mucosal alteration is evidence of systemic disease.

Limitations

This review has limitations inherent to its narrative design and to the heterogeneity of the available literature. The evidence spans mechanistic studies, observational research, systematic reviews, consensus statements, and clinical reviews, with different populations and objectives. The structured search was intended to improve transparency and conceptual coverage but was not designed as a systematic review with duplicate screening or quantitative synthesis. In addition, the literature does not provide validated diagnostic criteria for oral mucosal fragility as a

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distinct clinical entity. Consequently, the proposed framework is conceptual and hypothesis-generating rather than a validated diagnostic algorithm.

Figure 1. Conceptual clinical framework

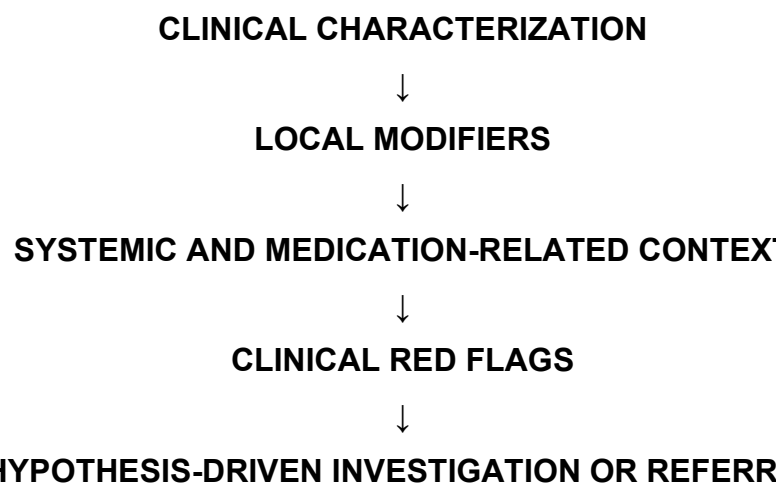


Figure legend: Sequential interpretation of oral mucosal alterations in older adults. The framework is an author-derived conceptual synthesis informed by the reviewed literature and is not a validated diagnostic algorithm.

5. Final Remarks

Oral mucosal alterations in older adults should not be interpreted through chronological age alone. Physiological aging is heterogeneous, and visible mucosal findings may be influenced by local exposures, salivary dysfunction, medication use, systemic conditions, or defined oral diseases. The current evidence does not support oral mucosal fragility as a validated diagnostic entity or biomarker of frailty or systemic vulnerability. A structured assessment that considers physiological aging, local modifiers, systemic and medication-related context, and clinical red flags can support more balanced clinical reasoning. Persistent, progressive, erosive, desquamative, vesiculobullous, multifocal, or otherwise unexplained lesions warrant

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hypothesis-driven investigation or referral when appropriate.

References

1. Qiu C, Jie W, Qian Y, Lu X, Chen Y, Si M. Ageing of the Oral Mucosa: Mechanisms and Consequences. Int Dent J. 2026;76(3):109482. doi:10.1016/j.identj.2026.109482.

2. Abu Eid R, Sawair F, Landini G, Saku T. Age and the architecture of oral mucosa. Age (Dordr). 2012;34(3):651-658. doi:10.1007/s11357-011-9261-1.

3. Wolff A, Ship JA, Tylenda CA, Fox PC, Baum BJ. Oral mucosal appearance is unchanged in healthy, different-aged persons. Oral Surg Oral Med Oral Pathol. 1991;71(5):569-572. doi:10.1016/0030-4220(91)90364-I.

4. Lynge Pedersen AM, Nauntofte B, Smidt D, Torpet LA. Oral mucosal lesions in older people: relation to salivary secretion, systemic diseases and medications. Oral Dis. 2015;21(6):721-729. doi:10.1111/odi.12337.

5. Tan ECK, Lexomboon D, Sandborgh-Englund G, Haasum Y, Johnell K. Medications That Cause Dry Mouth As an Adverse Effect in Older People: A Systematic Review and Meta-analysis. J Am Geriatr Soc. 2018;66(1):76-84. doi:10.1111/jgs.15151.

6. Tanaka T, Hirano H, Ikebe K, et al. Consensus statement on “Oral frailty” from the Japan Geriatrics Society, the Japanese Society of Gerodontology, and the Japanese Association on Sarcopenia and Frailty. Geriatr Gerontol Int. 2024;24(11):1111-1119. doi:10.1111/ggi.14980.

7. Maderal AD, Salisbury PL 3rd, Jorizzo JL. Desquamative gingivitis: Clinical findings and diseases. J Am Acad Dermatol. 2018;78(5):839-848. doi:10.1016/j.jaad.2017.05.056.

8. Lo Russo L, Fedele S, Guiglia R, Ciavarella D, Lo Muzio L, Gallo P, Di Liberto C, Campisi G. Diagnostic pathways and clinical significance of desquamative gingivitis. J Periodontol. 2008;79(1):4-24. doi:10.1902/jop.2008.070231.

9. Mahmood MN. Direct Immunofluorescence of Skin and Oral Mucosa: Guidelines for Selecting the Optimum Biopsy Site. Dermatopathology (Basel). 2024;11(1):52-61. doi:10.3390/dermatopathology11010006.

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Pages: 1-11

10. Maderal AD, Salisbury PL 3rd, Jorizzo JL. Desquamative gingivitis: Diagnosis and treatment. J Am Acad Dermatol. 2018;78(5):851-861. doi:10.1016/j.jaad.2017.04.1140.

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