

INPLASY2025110067
doi: 10.37766/inplasy2025.11.0067
Received: 21 November 2025
Published: 21 November 2025

Corresponding author:
Jing Sun

sunjing20250909@163.com

Author Affiliation:
Jinan Stomatological Hospital.

Biomarkers for differentiating diabetic periodontitis from chronic periodontitis: A systematic review and meta-analysis

Zhang, L; Li, R; Zhang, S; Kong, W; Zhang, P; Zhang, W; Sun, J.

ADMINISTRATIVE INFORMATION

Support - The study was supported by grants from the Science and Technology Development Program of Jinan Municipal Health Commission (2023-2-161) and Clinical medicine science and technology innovation plan of Jinan (202328023).

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2025110067

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 21 November 2025 and was last updated on 21 November 2025.

INTRODUCTION

Review question / Objective To identify discriminatory biomarkers between diabetes mellitus-related periodontitis (DMCP) and chronic periodontitis (CP)CP to provide an evidence-based foundation for improved clinical management.

Condition being studied DMCP and CP exhibit significant differences in clinical presentation, pathogenesis, and treatment outcomes. However, reliable biomarkers for their early differentiation remain elusive, often leading to misdiagnosis and suboptimal treatment.

METHODS

Search strategy PubMed: (("diabetic periodontitis"[MeSH Terms] OR "diabetic periodontitis"[Title/Abstract] OR "diabetes mellitus

complicated with periodontitis"[Title/Abstract] OR "diabetes complicated with periodontitis"[Title/Abstract]) AND ("chronic periodontitis"[MeSH Terms] OR "chronic periodontitis"[Title/Abstract]) AND (biomarkers[MeSH Terms] OR "biological markers"[MeSH Terms] OR "inflammatory factors"[Title/Abstract] OR "matrix metalloproteinases"[MeSH Terms] OR "advanced glycation end products"[MeSH Terms])

EmBase: ('diabetic periodontitis'/exp OR 'diabetes mellitus complicated with periodontitis' OR 'diabetes complicated with periodontitis') AND ('chronic periodontitis'/exp OR 'chronic periodontitis') AND ('biomarker'/exp OR 'biological marker' OR 'inflammatory factor' OR 'matrix metalloproteinase'/exp OR 'advanced glycation end product'/exp)

Cochrane library: (diabetic periodontitis OR "diabetes mellitus complicated with periodontitis"

OR "diabetes complicated with periodontitis") AND "chronic periodontitis" AND (biomarkers OR "biological markers" OR "inflammatory factors" OR "matrix metalloproteinases" OR "advanced glycation end products")

Web of Science: TI=(diabetic periodontitis OR "diabetes mellitus complicated with periodontitis" OR "diabetes complicated with periodontitis") AND TI=(chronic periodontitis) AND TI=(biomarkers OR "biological markers" OR "inflammatory factors" OR "matrix metalloproteinases" OR "advanced glycation end products") OR AB=(diabetic periodontitis OR "diabetes mellitus complicated with periodontitis" OR "diabetes complicated with periodontitis") AND AB=(chronic periodontitis) AND AB=(biomarkers OR "biological markers" OR "inflammatory factors" OR "matrix metalloproteinases" OR "advanced glycation end products").

Participant or population Patients with a confirmed diagnosis of DMCP and patients with CP.

Intervention studies that measured and reported the expression levels of biomarkers in both patient groups.

Comparator NA.

Study designs to be included Published cross-sectional, case-control, or cohort studies.

Eligibility criteria The inclusion criteria were as follows: (1) Population: patients with a confirmed diagnosis of DMCP and patients with CP; (2) Exposure/Outcome: studies that measured and reported the expression levels of biomarkers in both patient groups; (3) Study type: published cross-sectional, case-control, or cohort studies; (4) Data availability: studies that provided complete data (e.g., sample size, mean, standard deviation, median, interquartile range) or from which these data could be extracted or calculated; and (5) Language: studies published in Chinese or English.

Information sources PubMed, Embase, the Cochrane Library, and Web of Science.

Main outcome(s) Studies that measured and reported the expression levels of biomarkers in both patient groups.

Quality assessment / Risk of bias analysis Newcastle-Ottawa Scale (NOS).

Strategy of data synthesis Differences in biomarker levels between the two patient groups were expressed as the Standardized Mean Difference (SMD) with a 95% Confidence Interval (CI). A random-effects model was employed for all meta-analyses to account for potential heterogeneity among the included studies.

Subgroup analysis NA.

Sensitivity analysis Sensitivity analysis was performed by sequentially excluding each individual study and recalculating the pooled effect size to evaluate the robustness of the results.

Language restriction No restriction.

Country(ies) involved China.

Keywords Diabetes mellitus-associated periodontitis; chronic periodontitis; biomarkers; systematic review; meta-analysis.

Contributions of each author

Author 1 - Li Zhang.

Author 2 - Ru Li.

Author 3 - Shengnan Zhang.

Author 4 - Wenhui Kong.

Author 5 - Peipei Zhang.

Author 6 - Wenyue Zhang.

Author 7 - Jing Sun.