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Biography

Zhou Zhao, is a dental healthcare professional based in Chongqing, currently affiliated with the The People's Hospital of Chongqing Liangping District. She is actively involved in clinical dentistry and oral health research, with a particular interest in preventive dentistry and oral microbiology. Her work focuses on understanding the progression of dental diseases, especially early-stage caries, and identifying clinical and microbiological factors that influence oral health outcomes. She is engaged in research aimed at improving diagnostic accuracy and developing predictive models to support early intervention and better patient management.

Clinical and Oral Microecological Factors Associated With Progression of Early Caries in Permanent Teeth Among Adults and Development of a Predictive Model

Abstract:

Background: Some early caries lesions remained stable over time after improvement of the oral microecological environment, whereas others progressed to cavitation and entered a stage requiring restorative intervention.

Objective: This study aimed to identify oral microecological factors associated with the progression of early caries in permanent teeth among adults and to develop a predictive model.

Methods: A retrospective study was conducted among patients with early caries treated at Liangping District People's Hospital, Chongqing, China, between January 2023 and June 2025. Patients(n=102) who experienced caries progression within 1 year of follow-up were assigned to the study group(n=40), whereas those whose carious lesions remained stable were included in control group(n=62).

Results: The baseline DMFT(5.7 ± 2.1 vs 4.8 ± 2.0), PLI(2.02 ± 0.48 vs 1.68 ± 0.45), and salivary pH(6.48 ± 0.27 vs 6.69 ± 0.31) differed significantly between the study group and control group($P < 0.05$). Multivariable logistic regression analysis showed that a higher baseline DMFT [$\alpha\text{OR} = 1.18(95\% \text{CI}, 1.00-1.39), P = 0.04$] and an increased PLI [$\alpha\text{OR} = 2.05(95\% \text{CI}, 1.09-3.86), P = 0.03$] were independently associated with progression of early caries, whereas a higher salivary pH was associated with a reduced risk of caries progression [$\alpha\text{OR} = 0.82(95\% \text{CI}, 0.67-0.99), P = 0.04$]. The combined predictive model demonstrated good discriminative performance [$\text{AUC} = 0.76(95\% \text{CI}, 0.66-0.85)$]. The Hosmer-Lemeshow test($\chi^2 = 8.62, P = 0.37$) indicated good model calibration.

Conclusion: Higher baseline DMFT and increased PLI were independently associated with progression of early caries, whereas a higher salivary pH was associated with a protective effect against caries progression.