Validating the Precision Periodontal Risk Assessment in Periodontitis Patients

Andrew Ramirez[1], Krishna Kumar Kookal [2], MS, Hsiu-Wan Meng[1], DDS, MS, Chun-Teh Lee[1], DDS, DMSc, MS

[1] Department of Periodontics and Dental Hygiene, The University of Texas Health Science Center at Houston, School of Dentistry, Houston, Texas, USA.

[2] Department of Diagnostic and Biomedical Sciences, The University of Texas Health Science Center at Houston, School of Dentistry, Houston, Texas, USA.

Objective: Periodontitis affects 46% of Americans aged over 30. Validating a risk assessment developed for periodontitis patients may serve as a clinical tool to halt the progression of periodontitis and aid in clinical management. This project aimed to validate the Precision Periodontal Risk Assessment (PPRA) built in the electronic health record (EHR) system by investigating the associations between risk factors and clinical outcomes.

Experimental Methods: This retrospective study was conducted by extracting data from EHRs of patients enrolled in UTHealth Houston dental clinics from March 2021 to May 2023. Periodontitis patients aged over 18 who completed scaling and root planning and re-evaluation visits were eligible. Tooth loss count per year was the primary outcome. The PPRA has eight risk factors: (1) bleeding on probing percentage, (2) sites with probing depth (PD)≥5mm, (3) teeth with PD ≥6 mm with vertical bone loss ≥3 mm and/or furcation involvement Class II or III, (4) radiographic bone loss to age ratio, (5) tooth loss due to periodontitis, (6) diabetes, (7)smoking, and (8) compliance. Each risk factor has three levels (low, moderate, high). According to the results of each risk factor, an overall periodontal risk profile (low, moderate, high) was assigned to the patient at the initial examination visit. The Generalized Linear Model (GLM) was used to analyze associations between risk factors or profiles and clinical outcomes.

Results: In total, 845 patients were included. The mean period enrolled in clinics was 0.92±0.53 years. The higher overall risk profile was significantly associated with more tooth loss count per year ($p<0.001$). When eight risk factors were included in a multivariable analysis, the risk factors (3), (5), and (8) were significantly associated with tooth loss count per year ($p<0.001$, $p<0.001$, $p=0.003$, respectively).

Conclusion: The risk profiles of PPRA were significantly associated with tooth loss, demonstrating PPRA's clinical validity.

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