

Cytokeratin-19 and Vascular Endothelial Growth Factor (VEGF): Promising Biomarkers in the Detection of Oral Squamous Cell Carcinoma and Oral Potentially Malignant Disorders

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Oral and oropharyngeal malignancies present a significant global health challenge, ranking sixth in global cancer prevalence. Despite the advancements, the five-year survival rate for oral cancer remains at 50%. Oral squamous cell carcinoma (OSCC) predominates in oral cavity malignancies, with betel quid chewing, smoking, and excessive alcohol consumption as major contributors. However, despite educational efforts, the persistent use of tobacco, alcohol, and areca nut suggests primary prevention measures are insufficient. The oral cavity's accessibility allows for early identification of OSCCs and Oral Potentially Malignant Disorders (OPMDs). This study aims to evaluate the levels of Vascular Endothelial Growth Factor-A (VEGF-A) and Cytokeratin-19 (CK-19) mRNAs in whole blood as a potential method for the early detection of OSCC and OPMDs. The study included 40 patients (each from OSCC, Oral Submucous Fibrosis (OSF), Oral Leukoplakia (OLK), Oral Lichen Planus (OLP), and 10 healthy controls). The expression levels of VEGF-A and CK-19 mRNAs were measured from extracellular RNA extracted from whole blood samples using real-time reverse transcription polymerase chain reaction (RT-PCR) with sequence-specific primers. Receiver operating characteristic (ROC) curve analysis was used to evaluate the effectiveness of these biomarkers in diagnosing. GraphPad Prism 4.0 software was employed for statistical analyses and the generation of diagrams. As the dataset is not normally distributed, the Wilcoxon signed-rank test was applied for two specific comparisons: OSCC versus controls and OPMD versus control. Analysis of 50 participants with OSCC, along with Oral Lichen Planus, Oral Submucous Fibrosis, Oral Leukoplakia, and healthy controls, revealed significant differences in biomarker levels between diseased and healthy groups. Combined VEGF-A and CK-19 biomarkers showed a 60% predictive probability for OSCC patients. In conclusion, this study highlights the efficacy of blood mRNA transcriptome diagnostics in early OSCC detection, presenting a promising clinical approach for improving cancer outcomes.

Keywords: Oral Cancer, OPMD, Risk Factors, Biomarkers, Blood, Predictive Probability

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