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Buccal Micronucleus Cytome Assay in Various Diseases

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ABSTRACT

Genomic instability and chromosomal damage play a crucial role in the onset and progression of numerous diseases in the humans, including cancer. The study of genotoxic and cytotoxic effects on exfoliated cells of the oral mucosa using the micronucleus (MN) assay allows the assessment of cytological changes and the spectrum of cytogenetic abnormalities within the organism. This method is also an effective tool for preventing the transformation of precancerous conditions—Oral Potentially Malignant Disorders (OPMD)—into oral cancer. MN are formed due to structural and numerical chromosomal aberrations. The measurement of MN in human cells has become one of the most widely used methods for assessing chromosomal instability and DNA damage caused by genotoxic agents. The goal of our study was to assess genetic changes in diabetes patients and individuals with oral cancer or precancerous conditions. Our results demonstrate a significant increase in MN levels, (which is a marker of chromosomal instability) as well as other nuclear abnormalities (indicating cytotoxic effects) in the buccal cells of all patient groups compared to the control group. These findings support the potential use of the buccal MN cytome assay as a biomarker of genetic damage in various diseases.

Keywords: micronucleus, nuclear anomalies, buccal mucosa, exfoliated cells

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