



Buccal micronucleus frequency is associated with age in Down syndrome

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ABSTRACT. Down syndrome has been linked to premature aging and genomic instability. We examined the frequency of micronucleus (MN) and binucleated cells in the oral mucosa of Down syndrome patients and healthy controls matched by age and gender, addressing the effect of age and family income. Down syndrome individuals had an increased number of MN (14.30 ± 9.35 vs 4.03 ± 1.71 ; $P < 0.001$) and binucleated cells (0.97 ± 1.3 vs 0.33 ± 0.66 ; $P < 0.05$) per 2000 cells. Micronucleus frequency of Down syndrome individuals correlated positively with age ($r = 0.437$; $P = 0.009$), and the older (≥ 21) Down syndrome age group (30.8 ± 8.4 years old) had about 2-fold more micronuclei ($P \leq 0.05$) than did the younger group (< 21). Average family income did not correlate with MN frequency in controls ($r = -0.948$; $P = 0.183$), but a borderline negative correlation was seen in DS subjects ($r = -0.9484$; $P = 0.0516$). Individuals whose average income was ten times minimum wages had about 2-fold less MN than those receiving around minimum wage. We conclude that the buccal MN assay is a useful and minimally invasive method for monitoring genetic damage in humans and could be used as a tool to evaluate age-associated genomic instability in Down syndrome.

Key words: Genomic instability; Down syndrome; Micronucleus; Buccal cells