GRAPE SEED EXTRACT POLYPHENOLS AND CURCUMIN REDUCE GENOMIC INSTABILITY EVENTS IN A TRANSGENIC MOUSE MODEL FOR ALZHEIMER'S DISEASE

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Introduction: Genome damage leads to altered gene dosage and expression and contributes to accelerated neuronal cell death. DNA damage events are elevated in lymphocytes and buccal cells from individuals suffering from Alzheimer's disease (AD).

Aims:

a) DNA damage is elevated in mice that carry mutations in the amyloid precursor protein and presenilin 1 that predispose to AD relative to non-transgenic control mice,

b) increasing intake of dietary polyphenols (curcumin or grape seed extract) may reduce genomic instability events.

Methods: DNA damage was measured using both buccal and erythrocyte micronucleus (MN) assays and an absolute telomere length assay in buccal and olfactory bulb tissue.

Results: MN frequency is higher in AD buccal mucosa (1.7 fold) and polychromatic erythrocytes (1.3 fold) relative to controls. Telomere length was significantly reduced by 91% in AD buccal mucosa relative to controls. Significant 10 fold decrease in buccal MN in AD mice fed curcumin (CUR) or microencapsulated grape seed extract (MGSE) and a 7 fold decrease for AD mice fed unencapsulated grape seed extract (GSE) compared to controls. In polychromatic erythrocytes a significant reduction in MN was found for the MGSE cohort (65.3%) compared to the AD Control. A 2 fold increase in buccal telomere length was evident for the CUR, GSE and MGSE groups compared to AD controls. Olfactory bulb telomere length was 2 fold longer in CUR fed mice compared to controls.

Conclusions: Results suggest potential protective effects of polyphenols against genomic instability events in somatic tissues of an AD transgenic mouse model.