Anti-oxidative, anti-glycative and anti-apoptotic effects of oleanolic acid in brain of mice treated by D-galactose.

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Abstract

Anti-oxidative, anti-glycative and anti-apoptotic effects of oleanolic acid in brain from D-galactose treated mice were examined. Oleanolic acid at 0.05%, 0.1% and 0.2% was supplied to mice for 10 wk. D-Galactose treatment increased reactive oxygen species and protein carbonyl levels (P<0.05), and reduced activity and protein production of glutathione peroxide, superoxide dismutase and catalase in mice brain (P<0.05). Oleanolic acid intake dose-dependently lowered reactive oxygen species and protein carbonyl levels (P<0.05), and retained activity and expression of these enzymes (P<0.05). Brain levels of carboxymethyllysine, pentosidine and methylglyoxal were significantly increased in D-galactose treated mice (P<0.05). Oleanolic acid intake significantly decreased the level of these parameters (P<0.05). D-Galactose treatments enhanced brain activity and protein expression of aldose reductase (AR); and declined glyoxalase I (GLI) activity and expression (P<0.05). Oleanolic acid intake dose-dependently diminished AR activity and expression (P<0.05), only at 0.2% retained GLI activity and expression (P<0.05). D-Galactose treatment up-regulated the activity, mRNA expression and protein production of nuclear factor-κB (NF-κB) p65, Bax and cleaved caspase-3 (P<0.05), as well as suppressed Bcl-2 production (P<0.05). Oleanolic acid intake at 0.1% and 0.2% suppressed NF-κB p65, Bax and cleaved caspase-3 production, and retained Bcl-2 expression (P<0.05). These findings support that oleanolic acid may be a potent neuro-protective agent against aging.

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