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Chronological Skin System Aging: Improvements in Reversing Markers with Different Routes of Green Tea Extract Administration

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Abstract : Green tea may provide an alternative treatment for many skin system disorders. Intrinsic or chronological aging represents the structural, functional, and metabolic changes in the skin, which depend on the passage of time per se. The aim of the present study is to compare the effect of green tea extract administration, in drinking water or topically, on the chronological changes of the old Swiss albino mice skin. A total number of forty Swiss albino female mice (Mus musculus) were used; thirty were old females, 50-52 weeks old and the remaining ten young females were about 10 weeks old. The skin of the back of all the studied mice was dehaired with a topical depilatory cream. Treatment with green tea extract was applied in two different ways: in the drinking water (0.5mg/ml/day) or topically, applied to the skin of the dorsal side (6mg/ml water). They were divided into four main groups each of 10 animals: Group I: young untreated, Group II: old untreated groups, Group III: tea-drinking (TD) group, and Group IV: topical tea (TT) group. The animals were euthanized after 3 and 6 weeks from the beginning of green tea extract treatment. The skin was subject to morphometric (epidermal, dermal, and stratum corneum thicknesses; collagen and elastin content) studies. The skin ultrastructure of the groups treated for 6 weeks with the green tea extract was also examined. The old mouse skin was compared to the young one to investigate the chronological changes of the tissue. The results revealed that the skin of mice treated with green tea extract, either topically or to less extent in drinking water, showed a reduction in the aging features manifested by a numerical but statistically insignificant improvement in the morphometric measurements. A remarkable amelioration in the ultrastructure of the old skin was also observed. Generally, green tea extract in the drinking water revealed inconsistent results. The topical application of green tea extract to the skin revealed that the epidermal, dermal and stratum corneum thicknesses and the elastin content, that were statistically significant, approach those of the young group. The ultrastructural study revealed the same observations. The disjunction of the lower epidermal keratinocytes was reduced. It could be concluded that the topical application of green tea extract to the skin of old mice showed improvement in reversing markers of skin system aging more than using the extract in the drinking water.

Keywords : aging, green tea extract, morphometry, skin, ultrastructure
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