Effects of isoflavones from red clover (Trifolium pratense) on skin changes induced by ovariectomy in rats

Estrogens have a profound influence on skin. The relative hypoestrogenism that accompanies menopause exacerbates the deleterious effects of both intrinsic and environmental aging. Estrogens improve skin in many ways. Among these, they increase collagen content, skin thickness and improve skin moisture. There is evidence that diets with high levels of phytoestrogenic isoflavones are associated with a low incidence of menopausal symptoms and osteoporosis. Plant extracts such as red clover, which contain high levels of isoflavones, have been used to reduce menopausal symptoms and have been shown to reduce bone loss in healthy women. In this study to investigate the effects of red clover isoflavones on skin aging, the histology of the skin, skin thickness and the amount of total collagen determined by a colorimetric method, were studied in ovariectomized rats after treatment for 14 weeks with a red clover extract standardized to contain 11% isoflavones determined by HPLC. In ovariectomized rats the thickness and keratinization of the epidermis were reduced; glands were less in number and vascularity was poor; the distribution and morphology of the collagen bundles and elastic fibers were altered. Whereas the skin of the ovariectomized rats treated with red clover isoflavones (20 and 40 mg of total isoflavones daily for 14 weeks) appeared well organized with a normal epidermis with uniform thickness and regular keratinization; vascularity, collagen and elastic fibers were well developed. The amount of collagen significantly increased in the treated group in comparison with the control group. These findings suggest that red clover isoflavones are effective in reducing skin aging induced by estrogen deprivation