

Skin, Menopause, & Aging

In postmenopausal women skin thickness decreases by 1.13% per post-menopausal year, with an associated decrease in collagen content (2% per post-menopausal year).¹ The collagen content (types I and III) of skin is thought to decrease by as much as 30% in the first five years following the menopause. Interestingly, this decrease in skin collagen content parallels the reduction in bone mass seen in post-menopausal women. The decrease in skin thickness and collagen content seen in elderly females appears to correlate more closely with the period of estrogen deficiency than with chronological age.^{1,2,12}

Topical Estrogen & Skin Thickness/Wrinkles

Studies have confirmed that topical estrogen increases epidermal thickness.^{10,7} Furthermore, Son et al (2005) demonstrated an increase in keratinocyte proliferation and epidermal thickness in response to only two weeks of topical estrogen in the skin of elderly *males and females*.¹⁰

In a randomized, double-blind, placebo-controlled trial, Maheux et al (1994), demonstrated that after 12 months of oral estrogen therapy, dermal thickness was increased by 30%.⁶ In a large cohort study it was shown that wrinkling is reduced in postmenopausal women administered estrogen.⁴ Creidi et al (1994) also demonstrated that skin wrinkling in postmenopausal women was improved by topical estrogen after only a 24-week treatment period.³ Additionally, topical progesterone cream (2%) alone has been shown to increase skin elasticity and decrease wrinkling in peri- and post-menopausal women.⁵

Topical Estrogen & Skin Collagen

The use of topical estrogen has also been shown to increase skin collagen. However, with topical administration, the effect was limited to the area to which the estrogen was directly applied.^{11,9}

Topical Estrogen & Skin Elastin

Punnonen et al (1987) demonstrated that topical estriol thickens elastin fibers in the papillary dermis, increases their number, and improves their orientation.⁸

¹Brincat M, Versi E, Moniz CF, et al. 1987. Skin collagen changes in post-menopausal women receiving different regimens of estrogen therapy. *Obstet Gynecol*, 70:123-7.

²Brincat M, Moniz CJ, Studd JW, et al. 1985. Long-term effects of the menopause and sex hormones on skin thickness. *Br J Obstet Gynaecol*, 92:256-9.

³Creidi P, Faivre B, Agache P, et al. 1994. Effect of a conjugated oestrogen (Premarin) cream on ageing facial skin. A comparative study with a placebo cream. *Maturitas*, 19:211-23

⁴Dunn, LB, Damesyn M, Moore AA, et al. 1997. Does estrogen prevent skin aging? Results from the First National Health and Nutrition Examination Survey (NHANES I). *Arch Dermatol*, 133:339-42.

⁵Holzer G, Riegler E, Honigsmann H, et al. 2005. Effects and side-effects of 2% progesterone cream on the skin of peri- and postmenopausal women: results from a double-blind, vehicle-controlled, randomized study. *Br J Dermatol*, 153:626-34.

⁶Maheux R, Naud F, Rious M, et al. 1994. A randomized, double-blind placebo-controlled study on the effect of conjugated estrogens on skin thickness. *Am J Obstet Gynecol*, 170:642-9.

⁷Patriarca MT, Goldman KZ, Dos Santos JM, et al. 2007. Effects of topical estradiol on the facial skin collagen of postmenopausal women under oral hormone therapy: a pilot study. *Eur J Obstet Gynecol Reprod Biol*, 130:202-5.

⁸Punnonen R, Vaajalahti P, Teisala K. 1987. Local oestriol treatment improves the structure of elastic fibers in the skin of postmenopausal women. *Ann Chir Gynaecol Suppl*, 202:39-41.

⁹Schmidt JB, Binder M, Demschi G, et al. 1996. Treatment of skin aging with optical estrogens *Int J Dermatol*, 35:669-74.

¹⁰Son ED, Lee JY, Lee S, et al. 2005. Topical application of 17beta-estradiol, increases extracellular matrix protein synthesis by stimulating tgfbeta signaling in aged human skin in vivo. *J Invest Dermatol*, 124:1149-61.

¹¹Varila E, Rantala I, Oikarinen A, et al. 1995. The effect of topical oestradiol on skin collagen of postmenopausal women. *Br J Obstet Gynaecol*, 102:985-9.

¹²Affinito P, Palomba S, Sorrentino C, et al. 1999. Effects of postmenopausal hypoestrogenism on skin collagen. *Maturitas*, 33:239-47.