

The effect of oral collagen peptide supplementation on skin moisture and the dermal collagen network: evidence from an ex vivo model and randomized, placebo-controlled clinical trials

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Journal of Cosmetic Dermatology 2015 September 12

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BACKGROUND: Skin dryness and an accelerated fragmentation of the collagen network in the dermis are hallmarks of skin aging. Nutrition is a key factor influencing skin health and consequently its appearance. A wide range of dietary supplements is offered to improve skin health. Collagen peptides are used as a bioactive ingredient in nutricosmetic products and have been shown in preclinical studies to improve skin barrier function, to induce the synthesis of collagen and hyaluronic acid, and to promote fibroblast growth and migration. Our aim was to investigate the effect of oral supplementation with specific collagen peptides on skin hydration and the dermal collagen network in a clinical setting.

METHODS: Two placebo-controlled clinical trials were run to assess the effect of a daily oral supplementation with collagen peptides on skin hydration by corneometry, on collagen density by high-resolution ultrasound and on collagen fragmentation by reflectance confocal microscopy. Human skin explants were used to study extracellular matrix components in the presence of collagen peptides ex vivo.

RESULTS: Oral collagen peptide supplementation significantly increased skin hydration after 8 weeks of intake. The collagen density in the dermis significantly increased and the fragmentation of the dermal collagen network significantly decreased already after 4 weeks of supplementation. Both effects persisted after 12 weeks. Ex vivo experiments demonstrated that collagen peptides induce collagen as well as glycosaminoglycan production, offering a mechanistic explanation for the observed clinical effects.

CONCLUSION: The oral supplementation with collagen peptides is efficacious to improve hallmarks of skin aging.