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RESEARCH ARTICLE

THE EFFECT OF ORAL COLLAGEN DRINK ON TEWL SCORE AND WRINKLE: A CASE SERIES

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ABSTRACT

Wrinkles are visible folds or creases in the skin. One of the factors that can cause wrinkling is the decline of skin hydration that can be known from measuring the TEWL score. Collagen is the scaffold for skin hydration, strength, and stability. It can lower the TEWL score and therefore reduce the appearance of wrinkles. However, until now there have not been many clinical studies on the use of collagen drink to improve TEWL score and wrinkle. We reported 3 patients with normal, borderline, and critical TEWL score with thin size wrinkle who were given an oral collagen drink. We measured improvement in TEWL scores with the Tewameter TM 300 and improvement in wrinkles with the A₁ Smart Skin Analyzer. At the beginning of this study, the mean TEWL score for all patients was 26 while wrinkle was 3.89. The patients were given 0.5 gram collagen drink for 14 days. There is an improvement in the TEWL score to 17 and wrinkle to 3.13. All TEWL and wrinkle results in these three patients were classified as normal and thin at the end of therapy.

INTRODUCTION

Wrinkles has always be a problem mostly on people with dry skin on their 30s. Wrinkles may be caused by intrinsic factors (e.g., ageing, hormonal status, and intercurrent diseases) and extrinsic factors (e.g., exposure to ultraviolet radiation and cigarette smoke). These factors contribute to skin fragility, epidermal thinning, loss of elasticity, and the formation of creases and lines in the skin.¹ These external and internal factors interfere with the physiological process of skin aging associated with a decline in collagen formation.^{2,3} Collagen fibers are synthesized primarily by the fibroblasts in the deeper layers of the skin.^{4,5,6} As such, rejuvenation of the biomatrix can be effectively improved only through a supply of sufficient nutrients via the blood stream. Collagen formation is diminished in mature skin and the biomatrix of the skin begins to collapse when the collagen scaffold loses its stability and strength.⁷ Factors such as sunlight, smoking, pollution, alcohol abuse, and nutrient deficiency can accelerate this process. The elasticity is then diminished, and lines and wrinkles emerge. Due to the loss of collagen, the skin becomes increasingly thinner and drier.⁸

Case Report

We reported three cases of men, aged 29 – 35 years old, with complaints of dry skin and wrinkles in their face. We further examined their skin with Tewameter TM 300 to examine the TEWL score and A₁ Smart Skin Analyzer to examine the appearance of wrinkle.

Then we gave the patient oral collagen drink 0,5 gram. The patients were ordered to drink the oral collagen two times a day for 14 days. After 2 weeks of treatment, we examined their skin again with the same tools and the same examiner. Improvement was achieved in all patients, both in the TEWL score and wrinkle (Table 1 and Figure 1).

DISCUSSION

Collagen is the main structural protein in connective tissues such as the skin, tendons, cartilage, and bones, constituting 25–30% of all proteins in the body.⁹ The dermal collagen fiber network becomes increasingly fragmented (i.e., presenting shorter and less organized fibers that accumulate as several fragments of degraded collagen) with age. Aging also increases the generation of metalloproteinases, which are enzymes that degrade collagen fibers, thus decreasing the synthesis of new extracellular matrix components, including the type of collagen produced by dermal fibroblasts.¹⁰ The overlap of extrinsic aging and intrinsic aging leads to functional and structural changes in the dermis, including volume reduction, elasticity loss, decreased epidermal thickness, increased wrinkles, and decreased capacity to retain moisture through the skin owing to decreased hyaluronic acid (a compound responsible for retaining water in skin structures) in the extracellular matrix.¹¹ A wide range of dietary supplements, aside from the traditional systemic antioxidants, have been used to improve skin health and achieve a younger appearance, such as some marine protein-based macromolecules.¹¹ However hydrolyzed collagen (HC), which has been used as one of the most recent and promising anti-aging systemic supplementation, demonstrated functional and beneficial effects on the skin in several scientific studies, mainly by improving the clinical signs of skin aging.

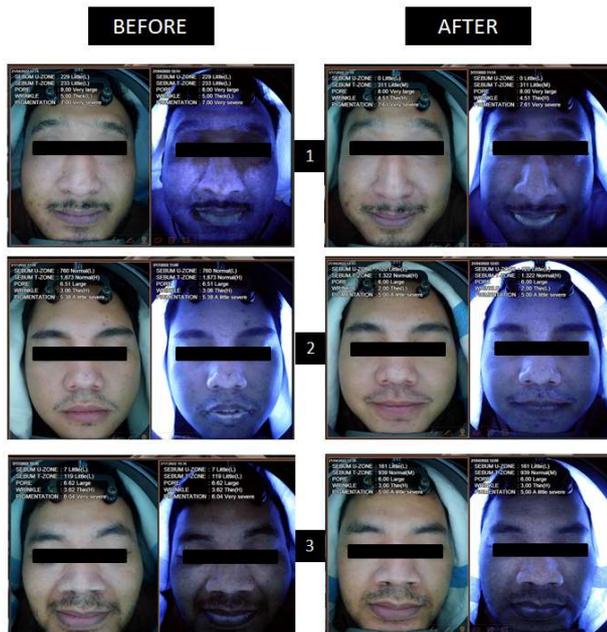


Figure 1. A1 Smart Skin Analyzer result on all of three patients

Table 1. TEWL score and wrinkle on all patients.

		Patient 1	Patient 2	Patient 3
TEWL Score	Before	30	27	23
	After	21	20	16
Wrinkle	Before	5,00	3,06	3,62
	After	4,51	2,00	3,00

Once digested, they are metabolized to dipeptides and tripeptides in the gastrointestinal tract and thereafter transported through the bloodstream and accumulate in the skin to form new collagen fibers.¹¹ The usage of oral collagen drink in this case series is because topically applied skin care products such as creams or lotions often fail to reach the deeper layers of the skin in order to causally and lastingly influence the skin aging processes. The aim to reach the dermis, the most important skin layer for the restoration of collagen synthesis, has been achieved by giving nutritional collagen. The TEWL score were examined with Tewameter TM 3000 with classification of TEWL score (gr/jam/m²): 0 - <25 (normal); 25 – 30 (borderline); and >30 (critical).¹¹ All of three patients showed improvement on TEWL score and wrinkle appearance. This results correlates with a study by Asserin et al.¹² They administered collagen peptides to patients and observed skin hydration and transepidermal water loss (TEWL).¹² In the first part of their study, they recruited 66 Japanese women, who were 40-59 years old, and treated half with either 10 g of daily collagen treatment for 56 consecutive days or placebo. Their results showed a statistically significant increase in skin moisture for the treatment group. In addition, the study by Bolke et al. showed that a daily intake of 2.5 g collagen peptides increased the level of hydration, skin elasticity, and dermal density, and decreased the area of the wrinkles in women aged >35 years after 90 days of supplementation.¹³

CONCLUSION

The combination of modalities therapy and minimizing the extrinsic and intrinsic factors of the formation of wrinkles is needed to optimize the management of dry skin and wrinkle. As it is revealed in the result of our case series, oral collagen drink had been proven for making improvement both in TEWL score and wrinkle in all three patients measured with Tewameter TM 300 and A₁ Smart Skin Analyzer. Further studies with larger population and different kind of nutritional collagen can be done in order to get a better statistical significance.

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