

Epidermal Growth Factor:

EGF is a 6 kDa polypeptide growth factor that has been of particular interest because of its ability to promote wound and ulcer healing when applied topically (1). Twenty healthy volunteers aged 33 to 54 years were enrolled in a randomized, controlled, split-face study. For 4 weeks, a periocular wrinkle was treated daily with either a soluble MS-EGF cream or a cream containing EGF alone. MS-EGF group showed statistically significant increase of dermal depth and density compared to EGF alone group after 4 and 8 weeks. In addition, there was a marked improvement shown in clinical and 3-dimensional skin image in MS-EGF group. The treatments were well-tolerated; no significant side-effect was note (2)

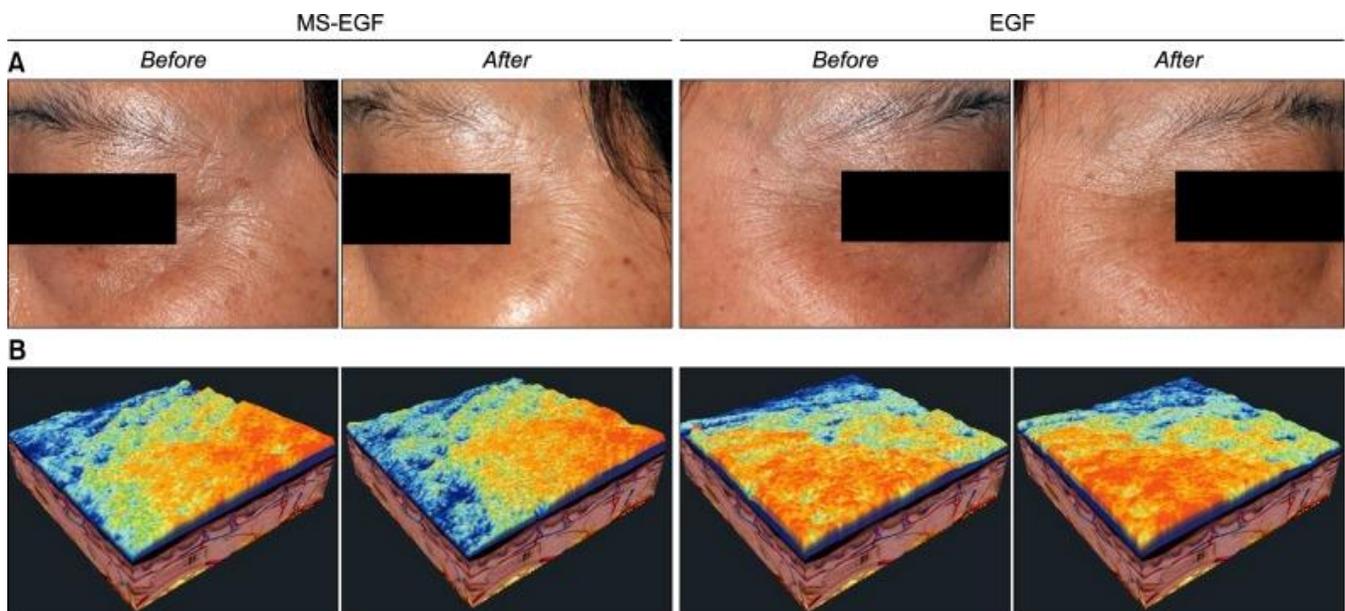


Fig 1) The Effect of Micro-Spicule Containing Epidermal Growth Factor (MS-EGF) and Epidermal Growth Factor (EGF) on Periocular Wrinkles

Insulin Growth Factor:

Insulin-like growth factor (IGF)-1 is a growth factor that can influence fibroblast functioning, with effects including the inhibition of collagenases and the induction of collagen expression. In the skin, IGF-1 is produced by dermal fibroblasts, where it stimulates these fibroblasts to proliferate and provide loose connective tissue. Also, it acts on epidermal keratinocytes stimulating their proliferation resulting in acanthosis, hyperkeratosis and sometimes papillomatosis, hence forming ST lesions (3).

Basic-Fibroblast growth factor (bFGF)

FGF basic (or bFGF) is a member of the fibroblast growth factor (FGF) family. FGF family members are heparin-binding multifunctional proteins and are involved in a variety of biological processes including angiogenesis, wound healing, and embryonic development. FGF2 which is highly expressed in skin tissue, has pro-angiogenesis and pro-migratory effect (4), and increase survival and proliferation, migration and differentiation potential of stem cells (5). FGF2 treatment enhanced the activity of c-Jun N-terminal kinase (JNK), a key regulator of fibroblast cell migration (6). Fig.3. Show the clinical result of topical application human fibroblast growth factor twice daily for 6 months. Improvement in fine rhytids and mottled hyperpigmentation is seen (7).



Fig.2) Improvement in fine rhytids and mottled hyperpigmentation after topical application human fibroblast growth factor

Vascular endothelial growth factor (VEGF)

Vascular endothelial growth factor (VEGF), a key mediator of angiogenesis, plays a key role in physiological processes and is a major contributor to several diseases including cancer and psoriasis. VEGF and HGF are known to be the most potent cytokines for the promotion of wound angiogenesis(8). VEGF, Is the most frequent stem cell (SC) growth factor secretion and play important role in angiogenesis to recover injuries. Topical application of cream contains mixture of growth factors including VEGF, PDGF-A, G-CSF, HGF, IL-6, IL-8, and TGF-beta (1) on 20 subjects for facial rhytides showed significant success between baseline and 3-month scores (9).



Fig.3) clinical result of rough skin texture with periorbital rhytides, VS smoother and significant improvement in the appearance of fine lines.

Extracellular matrix proteins: Collagen, Fibronectin and Elastin

Within the dermal ECM, aging is associated with a thickening of collagen fibrils and disorganization of total collagen content, mainly due to decreased collagen I synthesis and increased fibril fragmentation. In addition, skin aging is associated with increased levels of matrix metalloproteinases, which can break down collagen and elastin fibers, combined with impaired transforming growth factor (TGF)- β signaling, which may reduce collagen deposition (10) (fig.5). Figure.4. in below show the clinical result of eight female patients between the ages of 35 to 60 years with Fitzpatrick skin types III to IV and mild-to-moderate photodamage, skin laxity, fine lines, and wrinkles (Fitzpatrick Wrinkle Scale: 3–6) were enrolled to receive the topical cream formulated with multiple growth factors, antioxidants, and a collagen-building peptide—ingredients that have been shown to increase collagen levels and provide long-term aesthetic benefits (11).

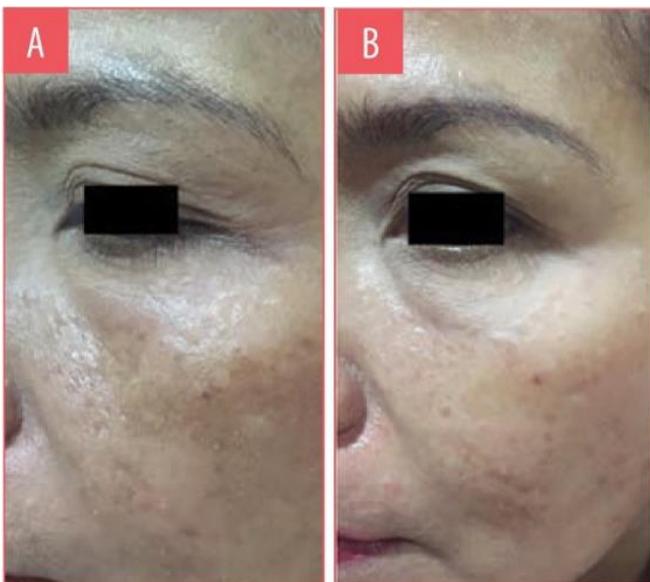


fig.4) Skin texture and wrinkles on the periorbital area A) before treatment and B) improvement seen after treatment

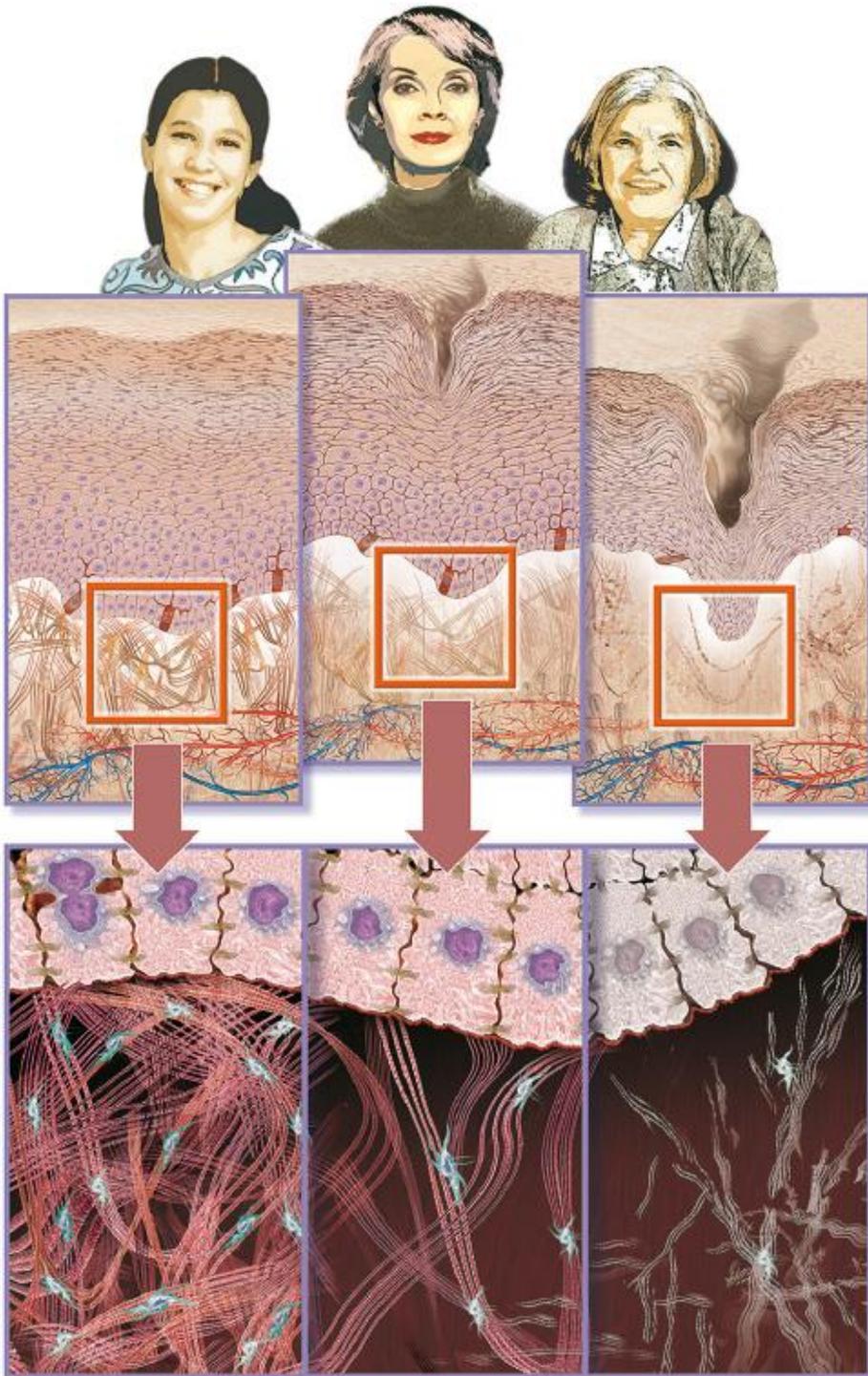


fig.5) As the skin ages, several changes occur in the epidermis and dermis. In the epidermis, corneocytes (terminally differentiated keratinocytes) accumulate, giving the skin a rough and dull appearance. In the dermis, the collagen content decreases and collagen and elastin fibers become disorganized and fragmented. This weakens the structure underlying the epidermis, leading to wrinkles. Illustration: © Kleinmans RED, source: www.skin-care-forum.basf.com.

Multi peptides Miracle:

Growth factors are not growth hormones. They are natural substances made by the skin cells that support the repair of damaged skin, as a result of ageing or environmental factors. They promote the formation of collagen and elastin to provide firmness and elasticity. Cells in ageing skin make fewer growth factors than cells in youthful skin. One approach to support the levels of skin rejuvenation is to regularly use skin care products with a high concentration of stable growth factors. Daily use of skin care products containing growth factors is known to help reduce the appearance of fine lines, wrinkles and improve skin tone and texture. Advances in biotechnology over the past decade have created multiple sources of growth factors. They can be derived from several different human cells grown in a laboratory (skin cells, bone marrow stem cells, fat stem cells), extracted from one's blood (PRP - Platelet Rich Plasma), or bioengineered from non-human sources such as snails and some plants. However, fat stem cells are likely to produce growth factors that help the functioning of fat cells, and bone marrow stem cells are likely to produce growth factors that improve the functioning of the bone marrow. Ideal growth factors for the skin would be produced by fibroblasts.

Combination of hyaluronic acid with a mixture of human growth factors in conjunction with the micro laser peel procedure for skin rejuvenation twice daily for one month, 15 female volunteers between 35 to 65 years of age with demonstrable facial wrinkling, the subjects reapplied the test products for another month. In the large majority of subjects, erythema or edema, crusts or erosions, and transitory stinging or burning sensations after the micro laser peel were minimal or mild when the skin was treated with the serum followed by the cream. The products helped to significantly improve hyperpigmentation, wrinkles, and texture as compared to before treatment (12).



Figure 3. Example of subject demonstrating reduced signs of skin aging after two micro laser peels when using a 1% hyaluronic acid serum in combination with a skin cream containing a mixture of proprietary human growth factors and cytokines as a pre- and postprocedural skin care regimen.

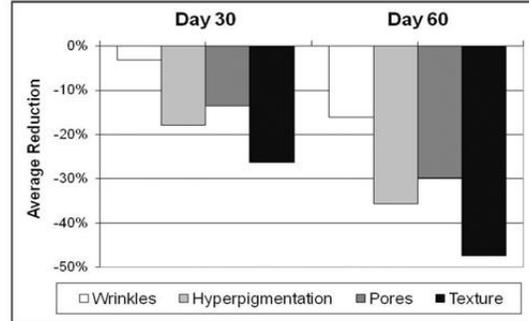


Figure 2. Wrinkles, hyperpigmentation, and pores were reduced and skin texture improved after micro laser peels. The improvements in the signs associated with skin aging were particularly pronounced one month after the second peel (Day 60). Reduction is shown as difference in averaged (n=15) clinical score before (baseline) and averaged clinical score after peels expressed in percentage of baseline scores and of all subjects completing the study.

Fig.6. Example of subject demonstrating reduced signs of skin aging when using a 1% hyaluronic acid serum in combination with a skin cream containing a mixture of proprietary human growth factors and cytokines as a pre- and postprocedural skin care regimen

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