

PROTEINS AND PEPTIDES OF INTERCELLULAR COMMUNICATION, STABILIZED WITH HYALURONIC ACID FOR TOPICAL USE TO RELIEVE INFLAMMATORY SKIN DISEASES AND PROMOTE WOUND HEALING

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Introduction

Hyaluronic acid (HA) is a widely known glycosaminoglycan of large size, involved in many physiological processes in tissues. There is evidence that HA plays a role in various pathological pathways such as inflammation and cancer. CD44 is the main receptor for HA membrane cells.

We know that high molecular weight HA has anti-angiogenic, anti-inflammatory and immunosuppressive effects, while smaller HA oligomers are pro-angiogenic, pro-inflammatory and immunostimulatory. HA is also strongly involved in leukocyte recruitment in the area of inflammation [1].

On the other hand, proteins and peptides of intercellular communication (PP) like for example growth factors stimulate or suppress cell and tissue growth in the suppression process, affect gene expression, DNA replication or T cell production, significantly accelerating healing or affecting inflammation of skin tissues.

Modulatory factors are capable of modulating the immune response and thus help play a role in modulating the inflammatory process. Transferrins, an antiviral, antibacterial, iron-binding proteins, modulates cytokine release. Its receptors have been found on several blood and skin cells [2-4]. Cytokines such as interleukins (IL) regulate the duration and intensity of the immune response, boost T-cell activity.

Materials and Methods

In vitro: Cell proliferation studies were performed using HA stabilized PP and an immortalized epithelial cell line. To study the inflammatory effects of components containing unstimulated HA peripheral blood mononuclear cells (PBMCs) and stimulated with PBMCs by mitogen, they were incubated with the active ingredients of the prepared PP and HA mixture. The measurement of neopterin production and tryptophan degradation was carried out by HPLC. Because PBMCs are mainly composed of T cells and macrophages, measurements were made to gain insight into the interaction between T cells and macrophages. Viable cell measurement was performed using the Trypan Blue method.

In vivo: Patients were asked to apply a PP and HA mixture at least twice a day in the morning and at bedtime.

The aim was to assess the efficacy and safety of the preparation in adults suffering from a number of skin conditions. 2 weeks before the study and during the study, patients did not use any topical preparations, steroids or phototherapy. The application was carried out on 120 patients.

Results and Discussion

The PP-HA gel has been shown to be effective for proliferation of an epithelial cell line, an important process in healing of damaged skin. The mixture has also been shown to be effective for a wide range of skin ailments. It heals difficult to heal post-operative wounds.

Healing of wounds may be due to the presence of several growth factors, identified in PP components, responsible for proliferation of normal epithelial cells. HA displays important biological properties and plays a significant role in crucial physiological processes especially when cellular plasticity is involved such as inflammation, immune reactions, angiogenesis, and wound healing. These varied physiological functions are related either to interactions with specific or less specific cellular membrane receptors or to the production of HA fragments of different sizes, generated for example by local traumatism or inflammation, fragments displaying specific properties according to their size [6].

HA was also shown to reduce TNF- α and morphological inflammation both in human A431 epidermoid skin cells and in mouse fibroblasts [6]. Studies have shown that hyaluronic acid [6][7] and PP interfere with immunopathogenic pathways which involve proinflammatory cytokines such as IFN- γ and TNF- α .

The suppressive influence of neopterin and kynurenine production by colostrum components and the suppressive effect of TNF- α by HA could explain the effects we have seen on patients with inflammatory diseases.

PP together with HA stimulates neopterin production and tryptophan degradation in unstimulated PBMC. This could be a way of treating some inflammatory diseases. PP and HA counteracts activation cascades in mitogen-stimulated PBMC (data not shown). This could be a way of treating other skin problems like psoriasis.

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