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New prospectives of Hyaluronic Acid in the upper airway chronic inflammation diseases

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Editorial

Hyaluronic acid (HA) is a naturally occurring polysaccharide which consists of a linear chain of fragments of d-glucuronic acid and N-acetyl-glucosamine linked by alternating β-3 and-β4 bonds.

It is an abundant constituent of the extracellular matrix of connective tissue, synovial fluid, embryonic mesenchyme, vitreous humor, skin, and several other organs and tissues of the human body [1].

HA plays a pivotal role in the homeostasis of respiratory apparatus.

High molecular weight HA is broken down under the influence of free radicals and enzymes during inflammation. Low molecular weight fragments deliver signal about tissue damage and mobilize immune cells, while high molecular weight form suppresses immune response preventing from excessive exacerbations of inflammation [2,3].

HA, which is a hygroscopic macromolecule and its solutions are highly osmotic, forms a scaffold that several sulfur proteoglycans bind to. Such structures can reach large size and are able to trap large quantities of

water and ions, providing hydration and tissue turgescence.

In the upper airway HA is primarily involved in the regulation of vasomotor tone and gland secretion and it significantly contributes to nasal mucosal host defense, stimulating ciliary clearance. Up to date, HA is widely used in several other branches of medicine and neither contraindications nor interactions with drugs are reported [4-6].

Some studies showed a role of HA in patients with upper aereo-digestive tract (UADT) chronic inflammatory disease [7], first of all in patients affected by chronic rhinosinusitis (CRS).

CRS is one of the most common chronic diseases in the United States affecting an estimated 35 million people and is one of the most common causes of absence from work and for visits to a family doctor's office. HA could be a new CRS treatment strategy that can minimize symptoms, promote recovery and prevent exacerbations [8,9].

In the same time, despite many advances in functional endoscopic nasal and sinus surgery, in the first weeks after procedures painless lavages of nasal fossae provide to eliminate secretions, crusts, and debris, procedure necessary to achieve complete recovery. Several different solutions are usually used for nasal lavages such as isotonic, hypertonic, or alkaline-buffered saline as well as ocean water have been used for nasal lavage. Topical HA administration could represent a supportive treatment for faster improvement of nasal respiration, also minimizing patients' discomfort in postoperative nasal and sinus surgery, promoting nasal mucosa healing in the first weeks after procedure [10-14].

Last but not least, some studies showed that topical HA can be an useful tool also in children affected by recurrent upper respiratory tract infections and to relief respiratory symptoms in cystic fibrosis [15,16].

To date, topical therapies guarantee a better delivery of high concentrations of pharmacologic agents to the nasal mucosa.

The strong connection between particle diameter and site of the high concentration of nebulized particles in the upper airway suggests that it should be mandatory to carefully choose the nebulizer device to get better therapeutic results.

Further studies on larger populations and with new specific nebulization devices for upper airway are needed to confirm these encouraging results on HA in chronic upper airway inflammation disease.

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