

## Analysis of hyaluronic acid usage in Municipality of Stip

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### Introduction

The purposes of skin care cosmetics include cleaning the skin, preserve the skin's moisture balance and stimulate skin metabolism. Skin care cosmetics contain substances which enable the skin to function properly. Hyaluronic acid (HA) and its sodium and potassium salts are important cosmetic ingredients that are incorporated in moisturizing and anti-ageing products. Additionally, products that contain HA represent only 5%, while more than 95% of the total products contain sodium hyaluronate. Hyaluronic acid has a unique capacity to link and retain water molecules. Furthermore, HA restrains the proliferation of the skin cells via the CD44 receptor and also has anti-inflammatory properties on the skin. (Kim et al., 2018). Currently, hyaluronic acid is produced by biotechnological methods at 37°C and pH7 from the bacterium *Streptococcus zooepidemicus*, which is generally defined as safe for the formulation of cosmetics (Liu et al., 2011; Vázquez et al., 2010)

HA is one of the most widely used active ingredients in cosmetics. HA is used in cosmetic formulations in concentrations ranging from 0.2 to 1%. The maximum concentration of NaHA in a body lotion is 2%. (Leite and Frade, 2021). Interest in using hyaluronic acid as a cosmetic ingredient in skin care products occurred with the discovery that the amount of HA found in natural skin diminishes with age, and when reintroduced into the skin care products, it keeps skin hydrated, attenuates the appearance of wrinkles, and smooths the skin. Hyaluronic acid (HA) has many qualities that make it superior to other substances used in skin regeneration, with pronounced moisturizing and anti-ageing effect.

Namely, this Active pharmaceutical ingredients (API) forms a film on the surface of the skin, protects the stratum corneum, prevents the occurrence of transepidermal water loss and provides hydration to the epidermis (Papaconstantinou et al., 2012; Scarano et al., 2020).

Due to various biological activities, HA products are increasingly in demand. Some formulations containing

HA are already available on the market, with a large experience in their use. Hyaluronic acid (HA) is an active ingredient, used in cosmetics, particularly formulated as emulsions or serums, claiming hydration and skin elasticity effect. These skin biophysical parameters are closely related to anti-wrinkle effect, but no rigorous scientific evidence does justify this statement completely. Additionally, it should be taken into consideration that the efficacy of hyaluronic acid depends largely on the molecular weight. Hyaluronic acid with lower molecular weight (50 and 130kDa) showed significant reduction of the appearance of wrinkles, compared to hyaluronic acid with higher molecular weight (Snetkov et al., 2020). This occurrence is due to the ability of hyaluronic acid to penetrate into the deeper layers of the skin. Nevertheless, high molecular weight hyaluronic acid is also used in the cosmetics industry.

### Materials and methods

In order to determine the information about the use of preparations with hyaluronic acid and the occurrence of side effects from it, we made a research by making a survey to 60 volunteers aged 35-60 years, with a place of residence in Stip.

### Results and discussion

From the constructed questionnaire answered by 60 respondents, 25% were over 30 years old, 45% were in the range of 30-40 years, 15% were aged 41-50, 10% were between 51-60 years and 5% older than 61 years. In general, the highest interest in the research is shown by the respondents with an average age of 30-50 years. Regarding the attitude of the respondents about the importance of skin care, 55% answered that skin care is very important, but the availability and affordable price play a key role. For 35% of respondents, the economic factor is not a problem at all, while 10% of respondents

believe that the use of skin care products is not significant. This percentage is understandable given the fact that these 10% are respondents around 30 years old who still have no interest in skin care products. In terms of usage of hyaluronic acid preparations, the survey showed that 84% of the respondents have already been using hyaluronic acid. Most of the respondents used creams, due to the easy application and availability, while a smaller part of the respondents use serums. Despite their greater effectiveness, the serum is less commonly used due to the feeling of dryness and the need for additional application of moisturizer. Also, dermal fillers with hyaluronic acid have been applied to only two respondents, who are satisfied with the achieved, long-lasting effect. In this case, the disadvantage is the painful application. Additionally, the affordable price is an advantage for the use of these preparations. From our survey we found that 89% of respondents did not notice side effects, while 11% of respondents noticed effects in the form of redness, increased dryness, tightness, burning and burning sensation, but those effects were immediate, and pass after application of an adequate moisturizer. Despite the fact that the awareness for the usage of hyaluronic based preparation is high, many of the respondents believe that their knowledge about it is superficial and they have needs for additional information and believe that the best source would be pharmacists starting from the fact that most respondents have heard of these preparations from pharmacist in a pharmacy.

## Conclusion

Hyaluronic acid as a biocompatible, biodegradable and non-immunogenic biopolysaccharide is widely used in medical and cosmetic purposes. According to the investigation conducted with a questionnaire, hyaluronic acid has a beneficial effect on the skin and in general, no side effects from its use have been registered. Despite the benefits of using it, the price is still the limiting factor for the use of Hyaluronic acid in most of the respondents. Increasing the use of Hyaluronic Acid can be achieved by implementing a better marketing plan and reducing the cost.

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