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Beyond Weight Loss: GLP-1 Receptor Agonists and Their Impact on Skin Thickness — A Narrative Review

Bader AlShehri, AlJazi AlSuyayfi and Abeer AlSuyayfi*

King Saud University, Prince Sultan Military Medical City, Riyadh, Saudi Arabia.

***Correspondence:**
Abeer AlSuyayfi, King Saud University, Prince Sultan Military Medical City, Riyadh, Saudi Arabia.

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ABSTRACT

GLP-1 receptor agonists (GLP-1 RAs) such as semaglutide and tirzepatide have become very popular for weight loss, including in Saudi Arabia. At the same time, many users notice a hollow face and loose skin after losing weight quickly, a change often called "Ozempic face". This review looks at what is currently known about the effect of these drugs on skin thickness. The available studies show that GLP-1 RAs clearly reduce the fat under the skin, but there is little evidence that they thin the dermis directly. Most of the visible changes seem to come from how fast and how much weight is lost.

Keywords

GLP-1 receptor agonists, Semaglutide, Skin thickness, Ozempic face, Weight loss.

Introduction

GLP-1 receptor agonists were first developed to treat type 2 diabetes, but today they are used widely for obesity. They work mainly by reducing appetite and slowing down stomach emptying, which leads to significant weight loss [1]. In Saudi Arabia their use has grown quickly; one survey in the Eastern Province found that 18.2% of overweight and obese adults had used one of these drugs at some point [2].

Along with their popularity, a new concern has appeared. Many patients report that their face looks thinner and older after treatment, with sunken cheeks and sagging skin. This has been called "Ozempic face" [3,4]. One way to study this problem objectively is to measure skin thickness. The aim of this review is to summarize what recent studies say about GLP-1 RAs and skin thickness, and whether the changes are caused by the drug itself or by the weight loss. Articles were found by searching PubMed and Google Scholar using terms such as "GLP-1", "semaglutide", "skin thickness" and "Ozempic face".

Skin Structure and Measurement

The skin is made of three main layers: the epidermis on the outside, the dermis in the middle, which contains collagen and elastin and gives the skin its strength, and the subcutaneous fat underneath, which gives the face its volume. Weight loss mostly affects the fat layer, but it may also affect the dermis over time. Skin thickness is usually measured using high-frequency ultrasound, which can show each layer clearly and is safe and painless [5]. Studies have shown that facial skin naturally becomes thinner with age, especially in women [5].

How GLP-1 RAs May Affect the Skin

GLP-1 receptors have been found in the skin, mainly in keratinocytes and hair follicles, although their exact role is still not clear [6]. Researchers have suggested a few ways these drugs could affect skin thickness. The most obvious is the rapid loss of fat under the skin, especially in the face, which leaves the skin loose and less supported [4]. Some authors also believe that fast weight loss reduces collagen and elastin, particularly if the person is not eating enough protein [7]. Another theory is that GLP-1 RAs act on stem cells in the fat layer of the skin and reduce collagen production [1], but this has not been proven in humans.

Interestingly, laboratory studies show the opposite effect at the cellular level. Semaglutide and liraglutide protected skin cells from damage, increased collagen production and helped wounds heal faster [8]. This suggests that the drug itself may not be harmful to the skin, and that the problem is more related to weight loss.

What the Studies Show

An ultrasound study of 25 patients with type 2 diabetes found that exenatide and liraglutide significantly reduced fat thickness at all the body sites measured [9]. This confirms that these drugs reduce the fat layer under the skin. Regarding the face, a systematic review in plastic surgery described clear facial volume loss in semaglutide users, giving them an older appearance [3]. However, a more recent review of 44 studies concluded that "Ozempic face" is not a disease caused by the drug, but a result of losing a lot of weight quickly, and that the same changes are seen after bariatric surgery [4].

Some studies have also tried to treat these changes. In one study of 29 adults who lost weight quickly, mostly on GLP-1 drugs, a topical cream increased the thickness of the cheek skin and fat by about 20% after 12 weeks [10]. In Saudi Arabia, a study of 254 users found that 40.2% had at least one skin side effect, mainly dry skin (21.2%) and itching (8.6%) [11].

Clinical Implications

Because the skin changes seem to depend on how fast weight is lost, patients should be told about this risk before starting treatment, especially older patients. Losing weight gradually and eating enough protein may help protect the skin [7]. Patients who are interested in aesthetic treatments such as fillers or skin tightening should wait until their weight becomes stable, otherwise the results may not last [3,4].

Conclusion

GLP-1 receptor agonists reduce the fat under the skin, and fast weight loss with these drugs can make the face look hollow and older. However, current evidence suggests that this is mainly caused by the weight loss itself and not by a direct effect of the drug on the dermis. Most studies so far are small and short, and very few measured the dermis on its own. Larger controlled studies using ultrasound are needed, including studies in Saudi Arabia, where these drugs are widely used.

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