

## Glutathione and Skin

Glutathione, a thiol tripeptide, has been utilized in the treatment of conditions of hyperpigmentation, such as melasma, lentigines, and post-inflammatory hyperpigmentation. Its anti-melanogenic properties may be due to inhibition of tyrosinase enzyme, skewing of melanogenesis from the darker eumelanin to the lighter pheomelanin, and/or scavenging of free radicals.<sup>1</sup> While glutathione has been used in oral, topical, and intravenous forms to accomplish these results, there are very few randomized, controlled trials to either support or discourage its use.

Two studies examined the efficacy of orally administered glutathione, one in the form of capsules and the other in the form of lozenges.<sup>2-3</sup> Both studies reported decreases in melanin indices after 2-4 weeks of use. There were no serious adverse effects, although researchers noted that long-term safety had yet to be established.

A third study evaluated the efficacy of oxidized glutathione, administered topically.<sup>4</sup> In this randomized, double-blind, matched-pair, placebo-controlled clinical trial, participants applied 2% oxidized glutathione lotion to one side of the face and placebo lotion to the other side twice daily for ten weeks. Researchers noted decreases in melanin indices on the side of the face treated with oxidized glutathione relevant to control, as well as increased moisture in the stratum corneum, suppression of wrinkle formation, and improvement in skin smoothness.

All three studies involving the oral and topical use of glutathione demonstrated objectively verifiable but reversible results on skin tone.

The fourth study was a placebo-controlled trial involving 50 participants, 25 in the treatment group and 25 controls. Researchers administered injections of a product called GSH Detox Forte to the 25 participants in the treatment group at a rate of two injections per week for 6 weeks, while the 25 participants in the control group received normal saline.<sup>5</sup> The ingredients of the treatment product included aqua, glutathione 1200 mg, ascorbic acid, hydrolyzed collagen 35 mg, and sodium chloride.

Nine participants were excluded from the treatment group analysis during the course of the study because eight developed abnormal liver function and one experienced anaphylaxis. Their matched controls were also excluded, resulting in a total of 32 participants.

Researchers noted that six of the 16 participants in the treatment group experienced skin lightening by the Taylor scale. However, there are a few potential problems with this study. Firstly, three of the 16 participants in the control group also experienced similar results. Secondly, unlike evaluation with melanin indices using a Mexameter MX-18, the Taylor scale is visual and therefore highly subjective. Third, the treatment group had a very high dropout rate with nine of the original 25 participants in this group discontinuing. And finally, eight of the nine who dropped out discontinued because of abnormalities in liver function tests. Because of the fact that glutathione is commonly used to treat a variety of liver concerns and typically results in improvements in liver function tests,<sup>6</sup> these abnormalities may be attributable to another ingredient in the product used or to some other cause.

There were no adverse effects noted with the use of oral or topical glutathione.<sup>2-4</sup> In the only study available that evaluated the efficacy of intravenous glutathione for skin hyperpigmentation, adverse effects of liver function abnormalities and anaphylaxis were observed. However, as previously noted, there were some potentially confounding factors. Additional long-term, well-designed studies are required to draw more sound conclusions regarding the use of intravenous glutathione to address hyperpigmentation.

## Reference List

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