

# Glutathione Under Scrutiny: infusion risks?

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## Abstract

Skin lightening has long been influenced by socio-cultural perceptions that favour lighter skin tones, leading to widespread use of depigmenting agents. Across the years, many have been used, such as mercury, hydroquinone, and potent steroids. Glutathione, a naturally occurring tripeptide with potent antioxidant and anti-melanogenic properties, has gained popularity for its skin-whitening effects. It modulates melanogenesis by inhibiting tyrosinase activity, shifting melanin production from eumelanin to pheomelanin, and reducing oxidative stress induced by ultraviolet radiation. Glutathione is available in oral, topical, and parenteral forms. Evidence suggests that oral and topical formulations, particularly when combined or enhanced with micro-needling, are relatively safe and may improve skin tone and texture. However, intravenous glutathione remains controversial due to limited clinical evidence, lack of standardised dosing, transient effects, and reports of serious adverse events, including renal failure and severe cutaneous reactions. Despite this, unregulated promotion and self-medication persist. Robust, large-scale clinical trials are urgently needed to establish efficacy, safety, and ethical considerations before recommending glutathione, particularly intravenous formulations, for cosmetic skin lightening.

This paper will critically review the biological basis, clinical evidence, safety, and ethical implications of glutathione use for skin lightening, with particular emphasis on comparing oral, topical, and intravenous routes, highlighting the risks of unregulated cosmetic use, and guiding dermatologists toward evidence-based and safe practice.

**Keywords:** glutathione, skin lightening, intravenous, infusion, parenteral.