

# Role of Zinc and Vitamin D in Acne and Hair fall

Hair loss and acne prone skin is a common problem that may be improved with vitamin and mineral supplementation, Zinc and Vitamin D comes under essential nutrients that play a vital role in maintaining healthy skin and hair. Zinc repairs the hair tissues and stimulate oil production to protect the scalp skin around the follicles. topical or oral forms of zinc treats and controls acne was proved in an 2013 systemic review. it decreases excess oil levels on the skin. Vitamin D is a fat-soluble vitamin synthesized in epidermal keratinocytes Vitamin D deficiency was found to be more frequent in patients with acne, which was inversely correlated with disease severity, indicating a potential role of vitamin D and zinc deficiency in acne pathogenesis also Vitamin D affects the hair cycle, and its role in hair loss is under constant research

Vitamins and minerals are important for normal cell growth and function and might contribute to hair loss when they are deficient. While supplementation is relatively affordable and easily accessible, it is important to know how it works in topical application in treating hair loss and acne.

The human scalp contains approximately 100,000 hair follicles. Of these, 90% are in the anagen phase, where there is no alopecia, requiring essential elements, such as proteins, vitamins, and minerals, to efficiently produce healthy hair. Micronutrients, including vitamins and trace minerals, are therefore crucial components in an diet. In protein-energy malnutrition, skin and hair changes are prominent, as seen, for example in children with kwashiorkor, marasmus, and marasmic-kwashiorkor conditions.

## Role of Vitamin D in Acne Skin:

Vitamin D is a fat-soluble vitamin synthesized in epidermal keratinocytes. Vitamin D obtained from the diet or synthesis in skin is inactive and needs to be activated enzymatically. Serum levels are

primarily maintained through the UVB-mediated conversion of 7-dehydrocholesterol in the skin to cholecalciferol, which is hydroxylated in the liver and kidney to the active form of 1,25-dihydroxyvitamin D [1,25(OH)<sub>2</sub>D]. There is strong evidence that vitamin D exerts an anti-inflammatory and immunoregulatory effect, in addition to its important role in maintaining adequate serum levels of calcium and phosphorus.

Vitamin D modulates growth and differentiation of keratinocytes through binding to the nuclear vitamin D receptor (VDR). Murine hair follicle keratinocytes are immunoreactive for VDR, showing their highest activity in the anagen stage. The role of vitamin D in the hair follicle is evidenced by hair loss in patients with vitamin D-dependent rickets type II. These patients have mutations in the VDR gene, resulting in vitamin D resistance and sparse body hair, frequently involving the total scalp and body alopecia. In addition, Forghani et al. identified novel nonsense mutations in the VDR gene in two patients that resulted in hereditary vitamin D-resistant rickets and alopecia

#### Role of Vitamin D in Hair loss:

Deficiency of micronutrients like vitamin D represent a modifiable risk factor associated with the development, prevention, and treatment of alopecia. Androgenetic alopecia (AGA), telogen effluvium (TE) are two common types of hair loss. Studies show that supplementing the diet with low levels of vitamin D can improve symptoms of these diseases. Studies have shown a relationship between AA and low vitamin D levels. Vitamin D should be supplemented if levels are low.

The most noteworthy of these is that micronutrients are major elements in the normal hair follicle cycle, playing a role in the cellular turnover of the matrix cells in the follicle bulb that are rapidly dividing

## Role of Zinc in Hair loss:

Zinc is involved in protein and nucleic acid synthesis, and plays a role in various metabolic pathways and cellular functions. With regard to hair loss, zinc is a potent inhibitor of hair follicle regression, and accelerates hair follicle recovery. More specifically, transient zinc deficiency is a major pathogenesis in acrodermatitis enteropathica, resulting in hair loss.

Arguments that zinc deficiency can be a disturbing factor for the growth of hair have been emerging since the 1990s. It should be noted that there is also a contradicting argument that there exists no relationship between zinc and hair loss. Even though a few studies have reported that zinc deficiency has correlations with alopecia areata (AA) and telogen effluvium (TE), no studies have mentioned the relation between zinc and androgenic alopecia so far.

## Role of Zinc in Acne:

V Acne vulgaris is a chronic disease of the pilosebaceous units presenting as inflammatory or noninflammatory lesions in individuals of all ages. The current standard of treatment includes topical formulations in the forms of washes, gels, lotions, and creams such as antibiotics, antibacterial agents, retinoids, and comedolytics.

Additionally, systemic treatments are available for more severe or resistant forms of acne. Nevertheless, these treatments have shown to induce a wide array of adverse effects, including dryness, peeling, erythema, and even fetal defects and embolic events. Zinc is a promising alternative to other acne treatments owing to its low cost, efficacy, and lack of systemic side effects.

Zinc has anti-inflammatory properties that help fight viruses and bacteria. Zinc help relieve some of the redness and irritation associated with moderate to severe acne and reduces acne scars. The form of zinc you take for acne treatment depends on many factors. Overall, there's been conflicting research on the best form of zinc for acne.

One [2012 study](#)<sup>Trusted Source</sup> reported that oral zinc was effective for inflammatory and bacterial forms of acne. Topical application carries less side effects, but it isn't considered to be as effective as oral supplementation. In addition to its anti-inflammatory properties, topical zinc may help clear acne-causing bacteria from the skin and reduce oil production. The form that can be used ultimately depends on the severity of acne, skin type, and current dietary habits. Topical zinc isn't effective for severe acne nodules and cysts.

Popular zinc products include:

- [Formula 10.0.06 One Smooth Operator Pore Clearing Face Scrub](#)
- [Dermalogica Medibac Sebum Clearing Masque](#)
- [DermaZinc Cream](#)

Reference :

1. <https://doi.org/10.1007/s13555-018-0278-6> The Role of Vitamins and Minerals in Hair Loss: A Review
2. **The role of zinc in the treatment of acne: A review of the literature**I: [10.1111/dth.12576](#).
3. Can You Use Zinc for Acne Spots and Scars? Review article