

Resident's Forum

## Cutaneous Manifestations of Nutritional Deficiencies

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### INTRODUCTION

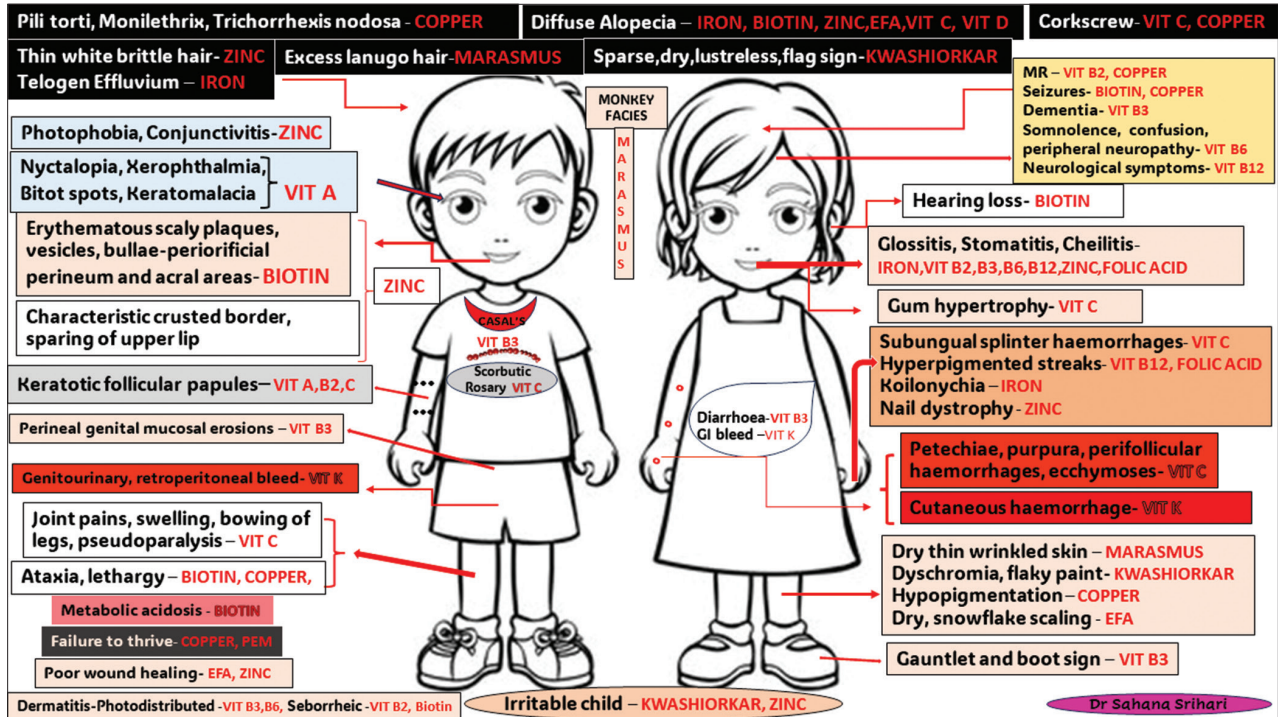
Proper nutrition is essential for the overall well-being of an individual. Insufficient intake of certain nutrients can lead to various health problems, including cutaneous manifestations.<sup>[1]</sup> This article aims to explore the different nutritional deficiencies that can affect the skin and their associated symptoms.

### DISTINCTIVE SKIN CHANGES OF NUTRITIONAL DISORDERS AND SELECTED DIFFERENTIAL DIAGNOSIS

Changes in the skin can identify nutritional disorders affecting skin appearance [Figure 1]. This condition can be differentiated from other disorders such as exfoliative erythroderma, kwashiorkor, atopic dermatitis, psoriasis and staphylococcal scalded skin syndrome. Skin changes like phrynodema may indicate deficiencies in Vitamins A, B-complex, C and essential fatty acids. Petechiae and purpura can be attributed to deficiencies in Vitamin K and C, as well as consumptive coagulopathy, coagulation disorders, thrombocytopenia, Ehlers–Danlos syndrome and cutaneous vasculitis like Henoch–Schonlein purpura. Yellow-orange discolouration may suggest carotenemia or jaundice, while hyperpigmentation may be caused by deficiencies in Vitamin B12, folate or Addison's disease. Photo-distributed dermatitis can be a result of Vitamin B3 or B6 deficiencies, connective tissue diseases such as systemic lupus erythematosus or dermatomyositis and polymorphous light eruption. Skin changes resembling seborrheic dermatitis may also indicate deficiencies in Vitamin B-complex. Angular stomatitis, angular cheilitis with candidal overgrowth and glossitis can be a sign of deficiencies in various vitamins, zinc, iron or underlying conditions such as Sjogren syndrome, oral lichen planus or syphilis. Diaper dermatitis might be associated with zinc deficiency or deficiencies in Vitamin B-complex. Lightening of hair can be due to malnutrition, copper deficiency or deficiencies in Vitamin B-complex. Poliosis or vitiligo may also cause changes in hair colour. Corkscrew hairs may suggest a deficiency in Vitamin C. Nail changes like koilonychia can be transient in young children or can be the result of iron deficiency or conditions like lichen planus, psoriasis or plummer vinson syndrome. Longitudinal hyperpigmented streaks on the nails may indicate deficiencies in Vitamin B3 or certain medications. Physiological factors, drug-induced side effects or trauma can also cause these nail changes [Tables 1 and 2].

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**Figure 1:** Cutaneous manifestations of nutritional deficiencies. EFA: Essential Fatty Acids, GI: Gastrointestinal, PEM: Protein energy malnutrition, Vit: Vitamin.

Vitamin	Cutaneous Manifestations
Vitamin A	Nyctalopia, xerophthalmia, bitot's spots, keratomalacia, keratotic follicular papules
Vitamin B2	Keratotic follicular papules, seborrheic dermatitis, glossitis, stomatitis, cheilitis
Vitamin B3	Perineal genital mucosal erosions, diarrhoea, dermatitis-photodistributed, dementia, glossitis, stomatitis, cheilitis, casal's necklace, gauntlet and boot sign
Vitamin B6	Dermatitis-photodistributed, somnolence, confusion, peripheral neuropathy, glossitis, stomatitis, cheilitis
Biotin	Seborrheic dermatitis, diffuse alopecia, seizures, hearing loss, erythematous scaly plaques, vesicles, bullae-periorificial, perineum and acral areas, ataxia, lethargy, metabolic acidosis
Vitamin B12	Hyperpigmented streaks on nails, neurological symptoms, glossitis, stomatitis, cheilitis
Vitamin C	Diffuse alopecia, corkscrew hairs, gum hypertrophy, subungual splinter haemorrhages, petechiae, purpura, perifollicular haemorrhages, ecchymoses, scorbutic rosary, keratotic follicular papules, joint pains, swelling, bowing of legs, pseudoparalysis
Vitamin D	Diffuse alopecia
Vitamin K	Gastrointestinal, genitourinary, retroperitoneal bleeding, cutaneous haemorrhage
Iron	Telogen effluvium, diffuse alopecia, glossitis, stomatitis, cheilitis, koilonychia
Copper	Pili torti, monilethrix, trichorrhexis nodosa, ataxia, lethargy, failure to thrive, corkscrew hairs, mental retardation, seizures, hypopigmentation of the skin
Folic acid	Glossitis, stomatitis, cheilitis, hyperpigmented streaks on nails
Zinc	Thin white brittle hair, photophobia, conjunctivitis, erythematous scaly plaques, vesicles, bullae-periorificial perineum and acral areas, characteristic crusted border, sparing of upper lip, poor wound healing, diffuse alopecia, irritable child, glossitis, stomatitis, cheilitis, nail dystrophy
PEM	Failure to thrive
Kwashiorkar	Sparse, dry, lustreless hair, flag sign, irritable child, dyschromia, flaky paint dermatosis
Marasmus	Excess lanugo hair, monkey facies, dry thin-wrinkled skin
EFA	Poor wound healing, dry, snowflake scaling, diffuse alopecia

PEM: Protein energy malnutrition, EFA: Essential fatty acids

**Table 2:** Differential diagnoses of nutritional deficiencies.

	Differential diagnoses
Vitamin B2	Sjogren syndrome, oral lichen planus or syphilis
Vitamin B3	Sjogren syndrome, oral lichen planus or syphilis, systemic lupus erythematosus or dermatomyositis and polymorphous light eruption, porphyrias, chronic actinic dermatitis, photosensitive drug eruptions and cutaneous lupus
Vitamin B6	Sjogren syndrome, oral lichen planus or syphilis, systemic lupus erythematosus or dermatomyositis and polymorphous light eruption.
Vitamin B12	Sjogren syndrome, oral lichen planus or syphilis, Addison's disease
Vitamin C	Thrombocytopenia, Ehlers–Danlos syndrome and cutaneous vasculitis like Henoch–Schonlein purpura
Vitamin K	Thrombocytopenia, Ehlers–Danlos syndrome and cutaneous vasculitis like Henoch–Schonlein purpura, liver disease, inherited coagulopathies such as haemophilia, von Willebrand disease and Wiskott–Aldrich syndrome
Iron	Sjogren syndrome, oral lichen planus or syphilis, lichen planus, psoriasis, Plummer–Vinson syndrome
Folic acid	Sjogren syndrome, oral lichen planus or syphilis, Addison's disease
Zinc	Sjogren syndrome, oral lichen planus or syphilis, psoriasis, seborrheic dermatitis, irritant dermatitis
Copper	Myelodysplastic syndrome, cutis laxa, child abuse, osteogenesis imperfecta, Ehler–Danlos syndrome

## CONCLUSION

Hence, identifying such skin changes and the associated deficiencies is of paramount importance which needs a thorough knowledge of these manifestations.

In our article, we have summarised all the findings into a pictorial representation which would help the residents to remember them more easily.

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## REFERENCE

1. Smith J. Skin Manifestations of Nutritional Deficiencies. In: Rook A, Burns T, Breathnach S, editors. Rook's Textbook of Dermatology. 9<sup>th</sup> ed. United States: Wiley-Blackwell; 2016. p. 1234-56.

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