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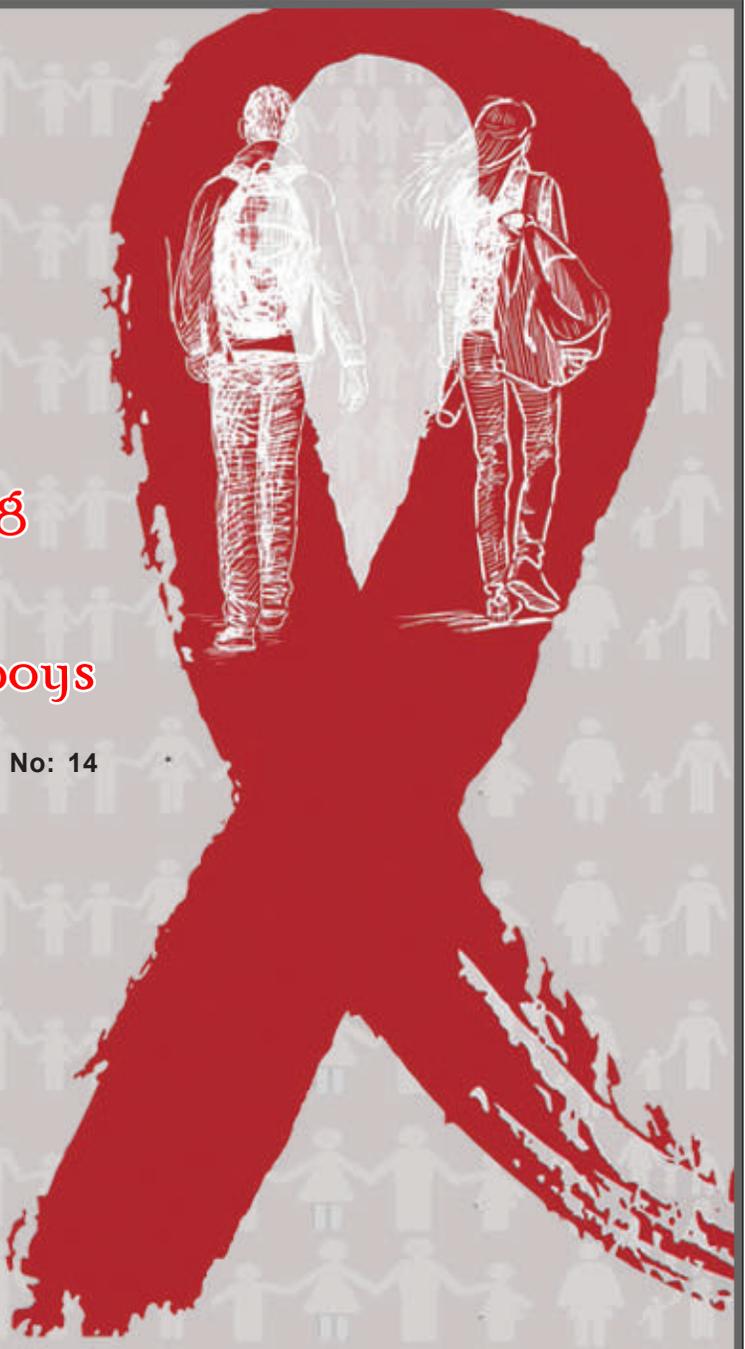
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# Biotin (10mg) in Skin Disorders

SANJAY AGRAWAL, ANSHU YADAV

This article reviews knowledge concerning the dermatologic manifestations of biotin deficiency and its treatment. Biotin is a water-soluble vitamin that acts as an essential cofactor for four carboxylases, each of which catalyzes an essential step in intermediary metabolism. In infants, children, and adults, deficiency of biotin causes alopecia and a characteristic scaly, erythematous dermatitis distributed around body orifices. *Candida albicans* often can be cultured from the skin lesions. Biotinidase deficiency, an inborn error, causes biotin deficiency, probably as a consequence of unpaired intestinal absorption, cellular salvage, and renal reclamation of biotin; biotinidase deficiency causes dermatologic manifestations similar to biotin deficiency.

## Role of Biotin in the Body:

Biotin plays a great role in our body. Some of the important benefits of biotin include the following.

1. Biotin helps in carbohydrate, fats and protein metabolism in the body and also assists in energy production in the body.
2. It is also known that biotin aids in maintaining good skin and hair. That is the reason

why hair loss, rashes on skin etc. are symptoms of lack of biotin or biotin deficiency in the body.

3. Biotin also helps in production of glucose in the body and this is why it also has an effect on the amount of sugar present in the blood. Thus, biotin is known for maintaining a healthy level of blood sugar in the body.
4. Biotin also plays an important role in proper functioning of nervous system.

## Causes of Biotin Deficiency:

### 1. Dietary Causes of Biotin Deficiency:

- o A diet containing raw egg whites quickly and invariably lead to biotin deficiency.
- o People receiving prolonged total parenteral nutrition therapy without any added biotin supplements in their diet are reported to have biotin deficiency.
- o Ketogenic diet or a diet with high protein and low fat can cause biotin deficiency.

### 2. Anticonvulsant Therapy:

It is also noted that prolonged use of some specific drugs, especially phenytoin, Carbamazepine, Primidone etc may cause biotin deficiency. It is found that certain anticonvulsants inhibit biotin transport across the intestinal mucosa. There are evidences suggesting that anticonvulsants accelerate biotin catabolism. Thus, it is suggested to add biotin supplements to daily requirements in order to prevent biotin deficiency, especially in patients who are

into anticonvulsant therapy for a long time.

### 3. Therapy Can Cause Prolonged Oral Antibiotic Biotin Deficiency:

People who are into prolonged oral antibiotic therapy can suffer from biotin deficiency.

### 4. Biotin Deficiency Caused Due to Genetic Mutation:

It is known that genetic mutation can cause biotin deficiency.

## Dermatological Manifestations of Biotin Deficiency:

Physical symptoms of biotin deficiency start appearing in the skin and hair at first.

1. There is a dry skin and is associated with Seborrheic dermatitis.
2. Fungal infections
3. Rashes, erythematous Dermatitis including macular rash and skin lesions appear
4. Hair loss or total alopecia is one of the physical symptoms of biotin deficiency

## Seborrheic dermatitis:

Seborrheic dermatitis is a common skin condition that mainly affects scalp. It causes scaly patches, red skin and stubborn dandruff. Seborrheic dermatitis can also affect oily areas of body such as the face, sides of the nose, eyebrows, ears, eyelids and chest. Seborrheic dermatitis is also called dandruff, seborrheic eczema and seborrheic psoriasis. For infants the condition is known as cradle cap and causes crusty, scaly patches on the scalp.

## Symptoms:

*Seborrheic dermatitis signs and symptoms may include:*

Dr. Sanjay Agrawal,  
Leading Pharmaceutical Consultant and Editor-in-Chief of IJMToday,  
6/146, Malviya Nagar, Jaipur - 302017. Rajasthan.  
Ms. Anshu Yadav,  
Pharmaceutical Consultant,  
QualPharma International,  
167, Pratap Nagar, Khatipura Road,  
Jaipur - 302021.

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1. Skin flakes (dandruff) on scalp, hair, eyebrows, beard or moustache
2. Patches of greasy skin covered with flaky white or yellow or crust on the scalp, face, sides of the nose, eyebrows, ears, eyelids, chest, armpits, groin area or under the breasts
3. Red skin
4. Itching

#### **Fungal skin Infections:**

Fungal skin infections should be treated with the appropriate agents. However controlling such skin infection may be difficult until the deficiency is corrected.

#### **Erythromatous Dermatitis:**

Erythroderma also known as exfoliative dermatitis. It is an inflammatory skin disease with erythema and scaling that affects nearly the entire cutaneous surface. The most common cause of erythroderma is exacerbation of an underlying skin disease such as psoriasis, contact dermatitis, seborrheic dermatitis, lichenplanus, pityriasis rubra pilaris or a drug reaction such as the use of topical steroids

#### **Alopecia:**

Hair loss also known as alopecia or baldness refers to a loss of hair from part of the head or body the severity of hair loss can vary from a small area to the entire body. Hair loss in some people causes psychological distress.

**Common types include:** male-pattern hair loss, female-pattern hair loss, alopecia areata and thinning of hair known as telogen effluvium.

#### **The Role of Biotin in Promoting Hair Growth and Avoiding Hair Loss:**

A Biotin Supplement plays an important part in hair growth.

Known as Vitamin B7 or Vitamin H, Biotin is one of eight in the B-vitamin complex. This B-vitamin complex specifically plays a role in maintaining the health and proper functioning of the nervous system, liver, eyes, skin, and hairs. A large variety of hair care products and supplements contain Biotin because of its immense benefits in hair growth. These products include medicated shampoos, split-end prevention products, conditioners and supplements that support healthy hair growth.

#### **Mechanism of Action of Biotin to Promote Hair Health:**

Biotin possesses rejuvenation characteristics which help in body's production of new cells. Biotin helps in preventing hair loss by rejuvenating both the hair follicles and scalp. This is highly beneficial for preventing shedding and also promotes hair regeneration.

Our bodies have the ability to manufacture Biotin, and that takes place in our intestines. That, combined with the fact that we just don't require much of it, makes it highly unlikely that we will be deficient.

Although it's a popular belief that Biotin does prevent hair loss, it is by no means proven. It's only 1/100 of the solution and, therefore should always be included in a supplement. However, taking Biotin alone shouldn't be expected to promote hair growth.

What Biotin does is support hair growth through metabolic function. Keratin is the building block of hair follicles and it's formed from several amino acids. Biotin plays its role in breaking down the dietary proteins into different amino acids required for the formation of keratin. Increasing keratin production in the body promotes the production of healthy hair follicles.

Biotin also prevents hair dryness and improves the elasticity of the cortex of the hairs – preventing the splitting and breakage of hair strands. This is why many split-end prevention products contain Biotin as an ingredient.

#### **Treatment:**

Two factors should be considered when determining an appropriate dosage of biotin for the purpose of restoring hair loss:

1. Age
2. current health condition

There is no set standard for the dosage of biotin vitamins because results vary based on the individuals taking the vitamins. However, the Institute of Medicine suggests these limits:

- 30 mcg (micrograms) for adults over 18 years of age
- 25 mcg for young adults ages 14 to 18
- 20 mcg for children ages 9 to 13
- 12 mcg for children ages 4 to 8
- 8 mcg for children ages 1 to 3
- 7 mcg for children under 12 months old
- 35 mcg for pregnant women

To make matters more confusing, most hair & nail supplements have dosages of 2,500 mcg or more. Biotin is a water-soluble vitamin so toxicity is highly unlikely.

Ingesting biotin orally has the most effective impact and shows the fastest results when it comes to hair growth. You can also combine biotin with other B vitamins, greatly strengthening hair health, along with overall health. While many people choose to take biotin pills, others are able to alter their diet to ensure they ingest enough biotin with foods such as: bananas, whole grains, cauliflower, mushrooms,

and soybeans. The foods with the highest biotin levels are: peanuts, cooked eggs, raw egg yolks, liver, Swiss chard, and certain vegetables.

#### **Conclusion:**

Biotin deficiency is rare and low levels may result in hair loss and other skin disorders. These may have multiple causes and taking biotin supplements may actually halt this process and even help to reverse it. "The general daily recommended dosage of biotin is 2.5 mg (or 2,500 mcg). Research demonstrating the

efficacy of biotin is limited. In cases of acquired and inherited causes of biotin deficiency as well as pathologies, Biotin is available in multivitamin and vitamin B complexes, and in individual supplements. Though its use as a supplement is prevalent, biotin supplementation may be of benefit.

For patients with inherited enzyme deficiency, larger doses of biotin supplementation are recommended. Biotin helps the body to properly metabolise fats and aminoacids, which are necessary for cell growth. It plays

key role in keeping skin, hair and nails healthy.

Biotin 10,000 mcg (10 mg) support healthy cell growth. It is effective in reversing the effects of hair loss for women. Biotin is a water soluble vitamin which means that the body cannot store it. This also means that it is not possible to overdose on it will pass through the body. The recommended dosage (10 mg daily) ensures that the body receives its daily needs for this nutrient.



### **Parasomnias and When to Refer to a Sleep Specialist**

Parasomnia involve abnormal and unnatural movements, behaviours, emotions, perceptions and dreams that occur while falling asleep, during sleep, between sleep stages or upon waking. They can occur during REM or non-REM sleep.

Most people experience a parasomnia during their lifetime. A large Canadian study found that 88% of children had at least one parasomnia between age five months and six years and the incidence begins to decline after age 25.

The most common non-REM parasomnias are bruxism (teeth grinding), somnambulism (sleep walking), confusional arousals and sleep terrors. These generally occur in the first third of the night, when non-REM sleep is deepest. The most common REM parasomnias are nightmares, REM behaviour disorder and recurrent sleep paralysis.

#### **Brief Recap on Sleep Stages**

Normal sleep is divided into non-rapid eye movement (NREM) and REM sleep. NREM sleep is further divided into progressively deeper stages

of sleep: stage N1, stage N2, and stage N3 (deep or delta-wave sleep). Stage N1 is considered a transition between wake and sleep. It occurs upon falling asleep and during brief arousal periods within sleep and usually accounts for 2%-5% of total sleep time.

Stage N2 occurs throughout the sleep period and represents 45%-55% of total sleep time. Stage N3 (delta or slow wave sleep) occurs mostly in the first third of the night and constitutes 5%-15% of total sleep time. REM represents 20%-25% of total sleep time and occurs in 4-5 episodes throughout the night.

Typically, N3 sleep is present more in the first third of the night, whereas REM sleep predominates in the last third of the night. This can be helpful clinically as NREM parasomnias such as sleep walking typically occurs in the first third of the night with the presence of N3 sleep. This contrasts with REM sleep behaviour disorder (RBD), which typically occurs in the last half of the night.