

Alopecia Associated With Hyperthyroidism

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Abstracts: Alopecia(hair loss) can occur as a result of any chronic systemic illness, endocrinopathies, pregnancy, lactation and by certain drugs. Among endocrine disorders, thyroid disorders are common. Both hyper and hypothyroidism are associated with alopecia. A case of 28year old women who presented with thinning of eyebrow, loss of patch of scalp hair & leg hair was investigated. Her thyroid function studies confirmed the diagnosis of hyperthyroidism. After treatment with antithyroid drugs, the eyelashes, scalp hair & leg hair regrew. So, it may be concluded that hair loss may be an early sign of hyperthyroid state. [Kamal S et al NJIRM 2012; 3(5) : 141-144]

Key words: hair loss, hyperthyroidism, women

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Introduction: Hair loss (alopecia) affects men and women of all ages and often significantly affects social and psychological wellbeing.

Although alopecia has several causes, a careful history, close attention to the appearance of the hair loss , and a few simple studies can quickly narrow the potential diagnosis.

Normally each day the scalp hair grows approximately 0.35mm (6inches per year), while scalp sheds approximately 100 hair per day¹. Every hair follicle continually goes through three phases : anagen (growth) , catagen (involution) , or a brief transition between growth and telogen (resting) . Disorders of alopecia can be divided into those in which the hair follicle is normal but the cycling of hair growth is abnormal (eg:- telogen effluvium) and those in which the hair follicle is damaged (eg:- cicatricial alopecia). Because each follicle passes independently through the three stages of growth, the normal process of hair loss is unnoticeable. At any one time, approximately 85 to 90% of scalp follicles are in the anagen phase of the hair growth. Follicles remain in this phase for an average of 3years (range 2-6yrs).¹

The transitional , or catagen , phase of follicular regression follows , usually affecting 2 to 3% of hair follicles.Finally , the telogen phase occurs , during which 10 to 15% of hair follicles undergo a rest period for about 3months. At conclusion of this phase, the inactive or the dead hair is ejected from the skin , leaving a solid hard , white nodule at its proximal shaft . The cycle is then repeated.

Although alopecia can occur anywhere on the body , it is most distressing when it affects the scalp. Hair loss can range from small bare patch that is easily masked by hairstyling to a more diffuse and obvious pattern.

Alopecia in women has been found to have significantly deleterious effects on self- esteem, psychologic wellbeing and body image.^{2,3}

In Androgenetic alopecia the presence of the androgen dihydrotestosterone , is the most common form of alopecia in men and women. Almost all persons have some degree of androgenetic alopecia⁴. Begins between the ages of 12 and 40yrs and is infrequently insufficient to be noticed. It is an aberration of normal hair cycle , it is theoretically reversible. Alopecia Areata is patchy hair loss of autoimmune origin⁴. It presents as a single oval patch or multiple confluent patches of asymptomatic, well –circumscribed non-scarring alopecia. It varies from small bare patch to loss of hair on the entire scalp. So called exclamation point hair are hallmark of the disorder. Occur in 2% of the general population , with men & women equally affected. It is more common in children and young adults. The course of alopecia areata is one of spontaneous remissions and recurrences. Although patients with this disorder are usually otherwise healthy, some have comorbid condition such as atopy, thyroid disease or vitiligo. Alopecia areata has been strongly associated with certain human leukocyte antigen class II alleles⁵.

Telogen effluvium is diffuse hair loss. Caused by any condition or situation that shifts the normal distribution of follicles in anagen to a telogen predominant distribution⁶. Daily loss may range from 100 to 300 hair. It may unmask previously unrecognized androgenetic alopecia. A number of conditions are associated with telogen effluvium. Stress is the most common underlying cause, the disorder also can develop because of normal physiologic events (eg:- lengthening of telogen in the post partum state), some medications and several endocrinopathies (thyroid, pituitary, & parathyroid disease). Treatment is based on identifying and treating or correcting the underlying cause of telogen effluvium.

Cicatricial alopecia. is hair loss resulting from a condition that damages the scalp and hair follicle⁴. In addition to a bald spot, the scalp usually has an abnormal appearance. It may be associated with certain infections, autoimmune diseases, scalp trauma and radiation therapy⁴.

Traumatic Alopecia is caused by cosmetic practices that damage hair follicles overtime⁴.

Trichotillomania – another cause of traumatic alopecia. Is a compulsive behaviour involving repeated plucking of one's hair⁷. With this background I would like to present a case of alopecia (telogen effluvium/alopecia areata) as the main presenting feature of hyperthyroidism. The thyroid function suggests hyperthyroid state.

Case study : A 28year old female working as a receptionist in the radiology department presented to skin department with a complain of large patch of hair loss on the scalp, eye brow thinning and loss of hairs of legs.

The dermatologist advised for the following investigations.

- complete blood count
- ESR
- Blood Urea
- Electrolytes – Na⁺, K⁺
- Liver function tests

- Thyroid function tests
- FSH, LH
- Rheumatoid factor
- Testosterone.

All the reports were within normal range except for thyroid function tests. Her TFT report was as follows –

- Total T₃ – 1.1ng/ml (n.v – 0.5 – 1.85ng/ml)
- Total T₄ – 17.2 µg/dl (n.v – 4.8 – 11.6µg/dl)
- TSH – undetectable (n.v- 0.39- 6.12µIU/ml)

She was referred to an endocrinologist for consultation. The blood tests were again repeated and her report was – fT₃ – 3.9 pg/ml (1.6 – 3.7 pg/ml)

- fT₄ – 1.9 ng/dl (0.8 – 1.8ng/dl)
- TSH – 0.04 µIU/ml (0.3 – 5.5µIU/ml)

The reports suggested increased thyroid hormone level and suppressed TSH level. She was given antithyroid drug twice daily. After a month of taking antithyroid drug, her scalp hair regrew and the patches have been fully covered with hair. Similarly her eyebrows which had thinned out also, started growing and so the hair on legs. Her blood tests were again repeated after 6months of starting antithyroid drug. Her results were :

Total T₃ – 0.88 ng/ml (0.5 – 1.85ng/ml)
 Total T₄ – 5.8 µg/dl (4.8 – 11.6 µg/dl)
 TSH – 3.0 µIU/ml(0.39- 6.12µIU/ml)

The drug dose was reduced to once a day and again the blood tests were repeated after two months. Her report was –

Total T₃ – 1.26 ng/ml (0.5 -1.85ng/ml)
 Total T₄ – 4.89 µg/dl (4.8 – 11.6 µg/dl)
 TSH – 3.67 µIU/ml (0.39- 6.12µIU/ml)

Discussion : Alopecia has a cosmetic effect on the person. It has to be treated according to the cause. The cause found in our case was hyperthyroidism. Hyperthyroidism itself is a diseased state of thyroid. It has a variety of presenting features. In our case the main presenting feature was hair loss.

This presenting feature is not very common. On treatment with antithyroid drug, the hair regrew. Similar case has been reported by Jordan Dr , Ahuja N. where they reported eyelash loss an early sign of the hyperthyroid state⁸. Systematic diseases often affect hair growth either selectively or by altering the skin of the scalp. One example is thyroid disorders. Hyperthyroidism causes hair to become thin & fine. Hypothyroidism thickens both skin & hair. According to Davidson's Book of principles and practice of Medicine – Alopecia may be classified into localized and diffuse . One of the cause of diffuse non-scarring alopecia is metabolic diseases, one of which is hyperthyroidism .

Figure 1 -The photograph of the lady's scalp hair before drug treatment



Figure 2- The photograph of the lady's scalp hair after drug treatment



According to Sperling LC, thyroid disorders are one of the causes of telogen effluvium¹. According to Healey PM⁹ and Drake LA¹⁰ – in evaluation of alopecia in women – thyroid function tests is one of the tests to be done to rule out thyroid disease if scarring is absent on physical examination of a female patient with alopecia.. So accordingly our case had hyperthyroidism as a responsible factor for alopecia which would be Telogen effluvium or alopecia areata , and on treating the case with antithyroid drugs the hair regrew and the disorder was corrected.

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