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Research Article

Thyroidism Effect on Alopecia Patients in Pakistan

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ABSTRACT

TSH (Thyroid Stimulating Hormone) is a hormone is secreted by the anterior lobe of the pituitary gland and stimulates the secretions of the thyroid gland. Its secretions are controlled by the TSH-R (Thyroid Stimulating Hormone-Receptor) on the epithelial cells of the thyroid gland. It controls the production of the thyroxine hormone from thyroid gland that is involved in the production of heat and energy. But the excessive amount of this hormone leads to the hair fall in some of the peoples. Hyper thyroidism correlates with the human skin and hair structure and its function. In case of hyperthyroidism hair bulb cell proliferation increases and hence hair fall rate also increases. While in case of hypothyroidism the bulb cell proliferation reduces and so, hair fall increases. Samples from different regions of the south Punjab were taken that were analyzed by the special chemistry analyzer (minividas). The concentrations of the T4 (Thyroxine), T3 (Triiodothyronine), and TSH were measured. Some of the alopecia patients were recorded high level TSH. The patients were treated with thyroxin tablets that reduces TSH level. After that the patients are also treated with hair fin tab, folli one shampoo, wistin tab, and multivitamins. Now the patients were observed with microscope. The growth of hair follicles and hairs were recorded. Hence, thyroxin tab use to decrease TSH level in body for 1 month. Hair fin tab, folli one shampoo, wistin tab and multivitamins are best treatment methods for the growth of hairs in alopecia patients.

Keywords: Thyroid stimulating hormone, Thyroidism, Alopecia patients, Hair growth

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INTRODUCTION

Thyroid abnormalities such as hypothyroidism and hyperthyroidism are associated with hyperpigmentation and hair structure and its function. A higher telogen rate changes the diameter, dryness, brittle, coarse hair and reduction in hair bulb cell proliferation and ultimately hair loss in hypothyroidism (Rebora A, 2019). While, in case of hyperthyroidism, there is increased hair bulb cell proliferation and hair loss. However, the exact mechanism is entirely unknown whether changes in the thyroid hormones levels are involved which directly affect the thyroid hormone receptors that expressing human scalp are associated with hair abnormalities, the hypothalamic-pituitary-thyroid axis are also associated with hair loss. Hypothyroidism is the situation in which the hormone from the pituitary gland known as TSH released from its anterior lobe that stimulate the production of the thyroid gland hormones in excessive amount (Schifter M, *et al.*, 2021). These hormones include T4, T3 and calcitonin. The functions of these hormones to produce heat, energy and calcium regulation in the body. The synthesis of the thyroid hormones is controlled by the (TSH-R) expressed on thyroid epithelia cells. The condition of hypothyroidism may lead to the reduction of the hair follicles (Penna G, *et al.*, 2021). The reduction in hair follicles leads to the loss of hairs. In mammalian body the hormone sensitive tissue system present in hair follicle. Numerous endocrine abnormalities are associated with alopecia and unwanted body hair growth. Body hair growth due to the high level of testosterone hormone, FSH (Follicle Stimulating Hormone) and LH (Luteinizing Hormone) (Grymowicz M, *et al.*, 2020). Hair loss in both male and female is called androgenic alopecia. The cause of this alopecia is the testosterone. Due to testosterone alterations hair follicles shrinks and that results in hair loss. As men have more testosterone level than women so alopecia or balding is more common in men

Cognate receptors expressed on the thyroid epithelial cells are activated by thyroid stimulating hormone. However, some evidence proves there are extrathyroidal target cells for the TSH stimulation also including adipose tissue. Moreover, it has been reported that HF human keratinocytes and human papilla fibroblast cultured *in vitro* and express the functional protein TSH-R mRNA and also human skin fibroblast also express this protein (Rahman S, *et al.*, 2019). The Human scalp HFs (Hair Follicles) and human skin express functional mediated signaling of TSH-R. Mostly females perform facelift surgery due to excess scalp on their skin and the human HF organ culture assays are selected for the study of integument region due to clinical importance of the scalp hair follicle.

Severe and prolonged hypothyroidism and hyperthyroidism can cause loss of hair. The loss is diffuse and involves the entire scalp rather than discrete areas. The hair appears uniformly sparse. Regrowth is usual with successful treatment of the thyroid disorder, though it will take several months and may be incomplete. Hirsutism is excess hair growth on the body or face. It's caused by excess hormones called androgens.

When hormone production is disrupted, specifically of hormones T3 and T4, it affects other processes in the body. This includes the development of hair at the root. Hair falls out and may not be replaced by new growth, resulting in thinning across your scalp and other areas such as your eyebrows.

Having autoimmune thyroid disease in particular also puts you at greater risk for alopecia areata-excessive and rapid hair loss in specific parts of the scalp that can advance to baldness and also affect other parts of the body, like the eyebrows.

Some excessive hair growth does not fit the pattern of growth triggered by androgen hormones (for example, hair between the eyes, on the forehead, on the temples or high on the cheeks of the face). This hair growth, called hypertrichosis, can be caused by thyroid problems or by anorexia nervosa.

MATERIALS AND METHOD

The blood sample was collected by the Multan region. There were totally 82 patients that belong to different areas of Multan region. The patient's form which the sample was collected were affected with hair follicles problems. Some of the patients were affected with alopecia. The alopecia is the condition in which patients have no hairs. The blood sample was put into gel vials and the vials were centrifuged at 3000rpm for ten minutes. After that serum was extracted from all the collected blood samples individually. After that T3, T4 and TSH tests were performed at special chemistry analyzer (minividas). The hair bulbs were examined with help of microscope. Some drugs were used for clinical trial for their hair (Sharma VK, *et al.*, 1996).

RESULTS

The blood sample of 82 patients belong to different areas of southern Punjab were used in molecular detection of thyroid function test, the mean age of patients was 49.0 ± 8.1 *(Table 1)*.

Table 1: Minimum and maximum age of thyroidism patient collected from different areas of Southern Punjab

S. No	Patient data	Patient age
1	Minimum age	20
2	Maximum Age	78
Mean ± S.E		49.0 ± 8.1

The age was categorized into 4 groups, 10-20, 20-40, 41-60 and above 61 age formed 1st, 2nd, 3rd and 4th group. Number of patients in age groups 10-20, 20-40, 41-60 and above 61 were, 07, 47, 23 and 5, respectively. The no of patient was found in order of 47>23>07>05 in 2nd, 3rd, 1st, and 4th age groups, respectively. The highest no of COVID patient (47) were found in 2nd group while the lowest patients (05) were found in 4th group *(Table 2)*.

Table 2: Distribution of thyroidism patient by age group

Age group	Number of patients
10-20	7
21 - 40	47
41-60	23
Above 61	5
Total	82

The maximum no of patients were observed in age 30 and 40, minimum no. of patients were found in both age 63 and 15. The results of paired t test was showed that the signification (P<0.05) (0.02) correlation was observed in age group (Simakou T, *et al.*, 2019).

The graph shows that observed patient are mostly hyperthyroidism>subclinical hypothyroidism>hypothyroidism=euthyroidism. In hyperthyroidism TSH level increases, T3 and T4 was decreased to their normal ranges and the follicle of these patient were reduced. These patients were treated with hair fin tab, folli one shampoo, wistin tablets and multivitamins for their better growth *(Figure 1)*.

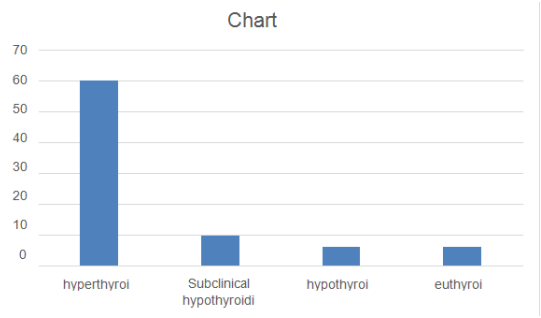

Figure 1: Graph indicating the patients with thyroid disorders

DISCUSSION

The patients in which level of TSH hormone is increased from the normal range have weak hair follicles. It means there is a great influence of TSH hormone on the growth of the hairs. The condition in which patients have high level of the thyroid stimulating hormones is called as hyper thyroidism. We treated the patients with thyroxin tablet to decrease the level of TSH hormone. After that the patients were also treated with hair fin tablets, folli-one shampoo, wistin tablets and multivitamins for better growth of hair follicles. The other ingredients such as the hair fin tablets folli one shampoo, wistin tablets and multivitamins play important role in growth of hairs as they have many vitamins and minerals for hair follicle growth. But the hormonal imbalance in the alopecia patients can only be controlled by the regulation of TSH hormones that is only controlled by the thyroxin tablets (Wilhelm SM, *et al.*, 2016).

CONCLUSION

It is concluded that there is involvement of the thyroid gland secretions in the growth of hair follicles and in the growth of hair. So, we can say that the hormonal imbalance in the thyroid gland may also cause alopecia (baldness). Especially the condition of hyper thyroidism mostly effects the hair follicles. So, we treated the patients with the thyroxin tablets to reduce the TSH level as well as other hair fin tablets, folli-one shampoo, wistin tablets and multivitamins for the nourishments of the hairs and hair follicle growth. These also reduce dendrites.

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