# Cutaneous Manifestations of Hypothyroidism A Prospective Hospital based clinical study in Bangladesh.

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**Abstract**

Normal functioning thyroid is much more important for healthy skin. The association of thyroid disorders with cutaneous manifestations is complex. Various studies have revealed multitude of cutaneous changes (in skin, hair and nails) that occur in thyroid hormonal dysfunction, in both hyper and hypothyroid states. The present study was designed to ascertain the varied cutaneous manifestations of hypothyroidism.This is a case control hospital based clinical study conducted in the Department of Dermatology and Venereology, BSMMU, over a period of one year, from May 2010 to May 2011. Fifty diagnosed cases of hypothyroidism constituted the subject material for the study and additional 50 Euthyroid persons were taken as control who were evaluated for the presence of any cutaneous manifestation. There are 50 patients of hypothyroidism among which 6 male & 44 female. The most common cutaneous feature in patients with hypothyroidism was coarse, rough, dry skin followed by pallor of skin, with carotenemia in 52.75% of the patients, nail changes in 38.9% of the patients, diffuse hair loss in 33.3% of the patients, palmoplantar keratoderma in 33.3% of the patients, and loss of lateral third of the eyebrows in 22.2% of the patients. Myxedematous facies were seen in 12% of the hypothyroid patients in our study. The relation between hypothyroidism and skin have profound clinical importance in dermatological practice.

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***Keywords:*** Cutaneous manifestations, hypothyroidism, Bangladesh.

## Introduction

Thyroid hormones are instrumental in regulating the health and appearance of skin and when the thyroid gland becomes underactive or overactive, a variety of skin problems may result[1].Cutaneous manifestations of hypothyroidism are protean in nature and affect all age groups. These dermatologic manifestations may occur secondary to the decreased thyroid hormone levels or due to the presence of thyroid autoantibodies that interact with skin components. Most of these cutaneous manifestations are nonspecific and many individuals without a definite thyroid problem may exhibit them. So, these do not allow diagnosis without the estimation of endocrine function[2].Some dermatological findings and diseases may be the first symptoms of thyroid diseases.Since there is a paucity of data regarding the cutaneous changes associated with hypothyroidism, the present study was designed to ascertain the varied cutaneous manifestations of hypothyroidism.

## Methods

This study was a case control hospital based clinical study conducted in the Department of Dermatology and Venereology, BSMMU, over a period of one year, from May 2010 to april 2011. Fifty diagnosed cases of hypothyroidism constituted the subject material for the study and additional 50 Euthyroid persons were taken as control& evaluated for the presence of any cutaneous manifestation.These patients were evaluated for the presence of

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any cutaneous manifestation. There was no age limit for inclusion in the study. A detailed medical history pertaining to hypothyroidism was elicited in each case with particular reference to the cutaneous complaints including duration, history of evolution and progression. An informed consent was taken from each patient, after which a general physical examination, systemic examination and a detailed dermatological examination was carried out and the relevant details recorded and tabulated. Apart from routine laboratory investigations, thyroid function tests (TSH, T3 and T4) were also done by electro-chemiluminescence assay (ECLIA). Statistical analysis of the data was performed by appropriate statistical methods using Statistical Package for Social Sciences (SPSS Version 17) and inferences were drawn.

## Results

Of the total patients selected for study, 50 were cases of hypothyroidism, and 50 euthyroid cases serving as control.

**Table 1: Age distribution of the study groups:**

| Age (yrs) | Group | |
|---|---|---|
| | Hypothyroid (n=50) | Control (Euthyroid) (n=50) |
| <20 | 14(28%)* | 9 (18.0) |
| 20-30 | 8(16%) | 13 (26.0) |
| 30-40 | 12 (48%) | 12 (24.0) |
| 40-50 | 14 (56%) | 6 (12.0) |
| >50 | 2(8%) | 10 (20.0) |
| Mean age* | 29.84±2.45 | 32.86±1.81 |

Range: hypothyroids = 11-52 yrs, control = 7-55 yrs

### Age distribution

Table I describes the age distribution of the study groups. 30-40 yrs formed majority in the hypothyroid groups. The mean age of the hypothyroids, control and hyperthyroids were 29.84+2.45, 32.86+1.81, 33.0+1.92 yrs respectively.

**Table II: Sex distribution of study groups:**

| Sex | Group | |
|---|---|---|
| | Hypothyroid (n=50) | Control (Euthyroid) (n=50) |
| Male | 6 (12.0)* | 16 (32.0) |
| Female | 44 (88.0) | 34 (68.0) |

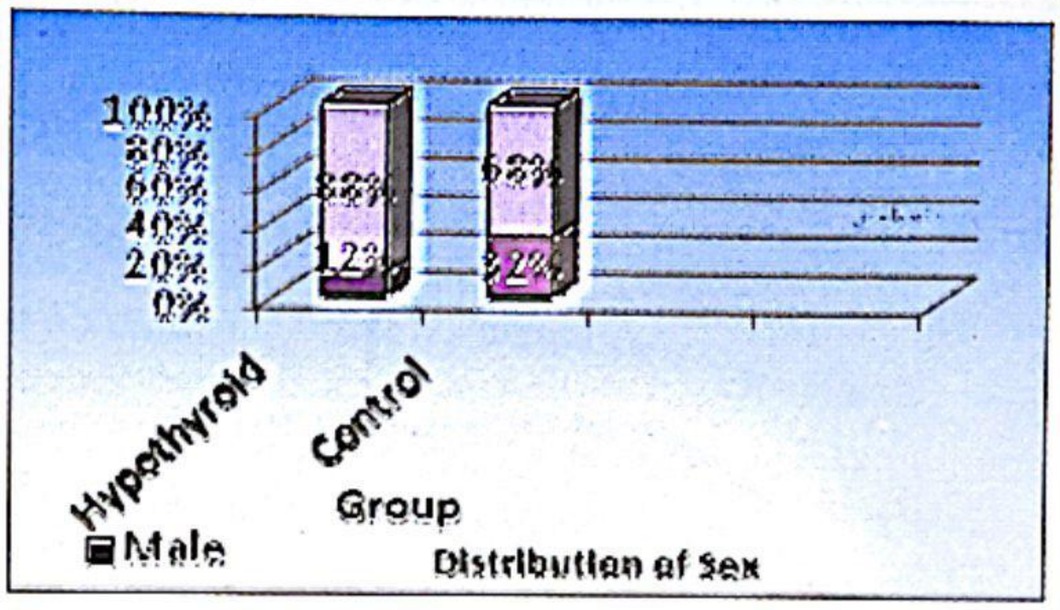


Figure-1

Table II & Fig. 1 highlights the sex distribution in three study groups. in all the groups female sex was found to be predominant (88% in hypothyroids, 68% in controls).

**Table-III: Cutaneous manifestation profile of hypothyroid cases:**

| Cutaneous manifestations | Group | | P-values |
|---|---|---|---|
| | Hypothyroid (n=50) | Control (n=50) | |
| Cool & dry skin<br>Warm & moist skin | 48(96.0)*<br>00 | 00<br>00 | <0.001<br>----- |
| Rough & thickened skin<br>Fine velvety & smooth skin | 48(96.0)*<br>00 | 00<br>00 | <0.001<br>----- |
| Pallor<br>Pallor & ivory yellow colour<br>in nasolabial fold, Facial flushing & erythema<br>on palm | 30 (60.0)<br>8 (16.0)<br>00 | 3 (6.0)<br>00<br>00 | <0.001<br>----- |
| Puffy oedema of face | 38 (76.0) | 00 | <0.001 |
| Palmoplantar keratoderma | 12 (24.0) | 1 (2.0) | 0.001 |
| Hyperpigmentation Vitiligo | 00<br>16 (32.0) | 00<br>00 | -----<br><0.001 |
| Eczema craquele | 8(16.0) | 00 | <0.001 |
| Chronic urticaria<br>Pruritus<br>Pretibial Myxedema | 8(16.0)<br>00<br>00 | 3 (6.0)<br>1 (2.0)<br>00 | 0.41<br>0.14NS<br>0.060NS |
| Thickened nails<br>Brittle & ridged nails<br>Plummer's Nail (Onycholysis) | 00<br>00<br>8 (16.0) | 00<br>3 (6.0)<br>00 | <0.001<br><0.001<br>---- |
| Clubbing | 00 | 2(4.0) | >0.05 |
| Early graying of hair<br>Partial loss of hair on scalp<br>Patchy alopecia on scalp | 00<br>00<br>8(16.0) | 3(6.0)<br>2 (4.0)<br>00 | >0.05<br>>0.05<br><0.001 |
| Diffuse partial loss of hair on scalp<br>Loss of hair on outer 3rd of eyebrow | 20(40.0)<br>14(28.0) | 2(4.0)<br>00 | <0.001<br><0.001 |

**Table-III:Show the comparison of cutaneous manifestations in hypothyroid and control cases.**

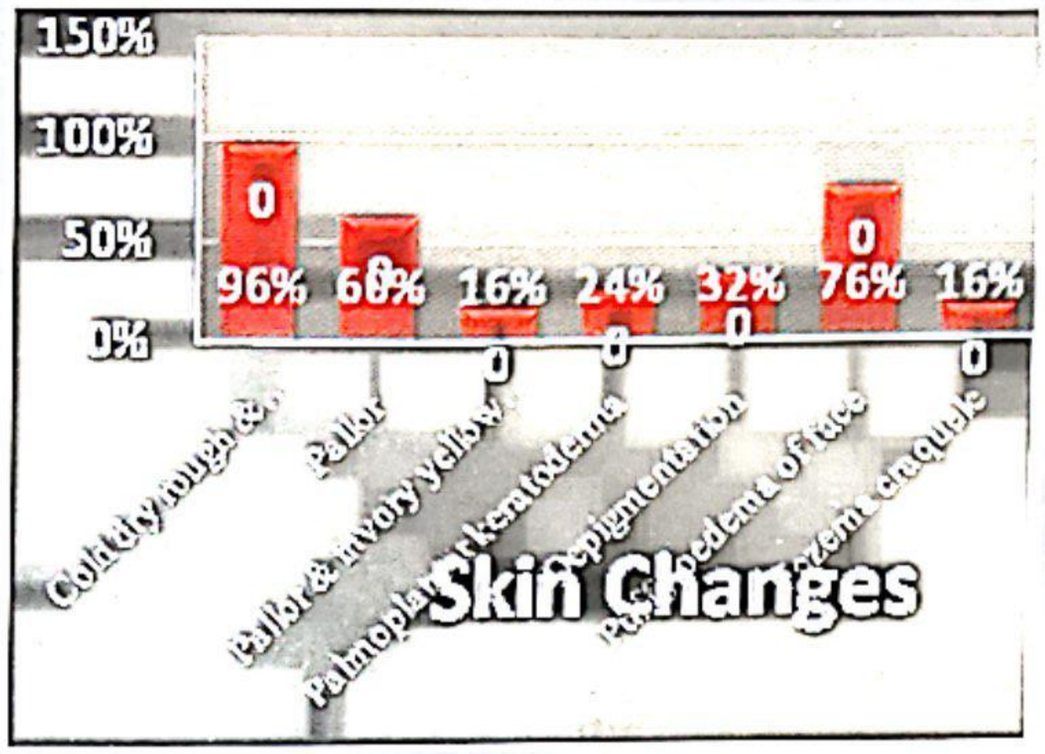


Figure-2

Fig. 2 shows the skin changes among the hypothyroid group.

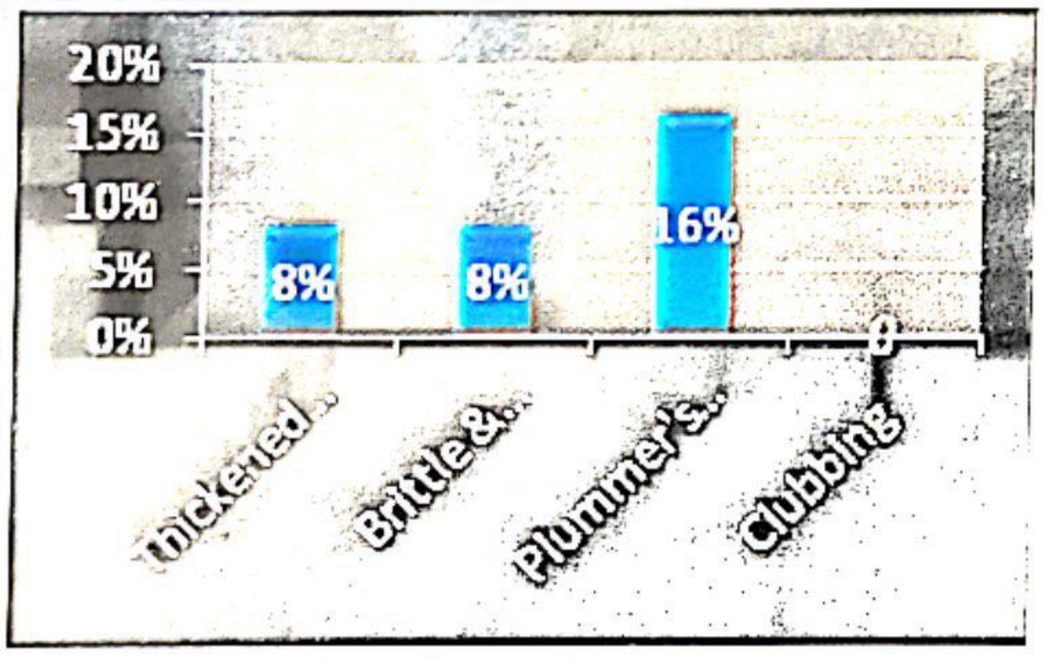


Figure-3

Fig. 3 shows the nail changes among the hypothyroid group.

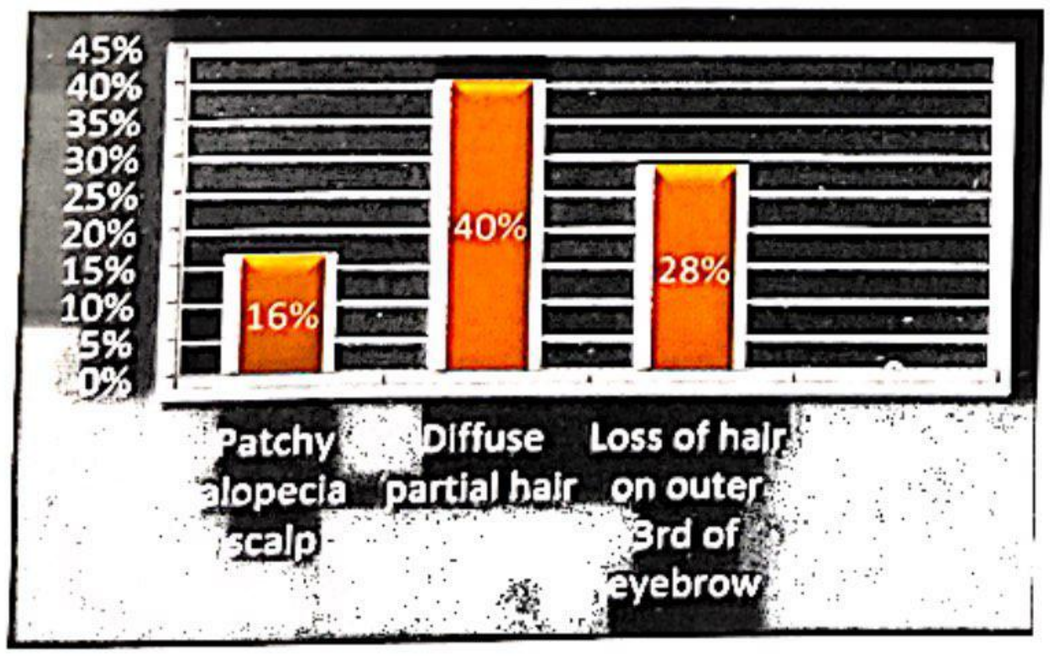


Figure-4

Fig.4 highlights the hair changes among hypothyroid group.

Out of 50 hyperthyroid patients 48(96%) had cutaneous manifestations.

## Discussion

The skin in hypothyroidism becomes cool, xerotic, pale and is covered with fine scales resembling ichthyosis[3]. Hypohidrosis, possibly accompanied by diminished epidermal sterol biosynthesis, may lead to acquired palmoplantar keratoderma.[4,5,6] A yellowish hue may be imparted to the skin, particularly on the palms, soles, and nasolabial folds, as a result of carotenemia observed in hypothyroidism.[7] Hair changes manifest as dry, coarse, brittle hair, with a tendency to fall out, resulting in diffuse, partial alopecia.[8] The eyebrows frequently disappear with loss usually originating laterally (madarosis).[9,10] Nails are thin, striated, brittle and grow slowly. Onycholysis has also been reported.[3] Hypothyroidism may be associated with a number of different cutaneous and/or systemic diseases. The cutaneous diseases associated with hypothyroidism include alopecia areata[11.12] chronic urticaria[13,14,15] vitiligo,[16,17] and scleroderma.[18] In our study group of 50 patients, there were 44 (88%) females and just 6 (12%) males, which corresponds to the study conducted by Indra et al.,[19] who observed 87% female patients in their study. This observation of female preponderance may be due to an increased association of autoimmune disorders in females, autoimmunity being an important cause of hypothyroidism. The predominant cutaneous symptom in our patients was dry skin (96%), followed by hair loss (40%) and puffy edema (76%). Similar observations were made by Jabbour et al.,[20] and Hueston, et al.,[21] in their studies. Urticaria was reported as a cutaneous complaint by 16% of patients, quite comparable to the study conducted in by Dogra et al.,[22] who found urticaria as a cutaneous complaint in 15% of their patients. Ivory yellow skin was a cutaneous complaint in 16% cases, which is higher in comperison with the result of the study by Rai et al.,[23] who reported it to be present in 5.12% of their cases. The least common cutaneous symptom was onycholysis, reported by 16%% of cases.We observed that the most common

## Conclusion

Various symptoms and signs related to skin, hair and nails, such as altered skin texture, xerosis, keratoderma, non-pitting edema, hyper-pigmentation, diffuse hair loss, coarse hair and brittle nails, go undiagnosed and many a times are not evaluated properly. In our study, hypothyroidism was closely associated with such cutaneous changes. It is thus recommended to evaluate for various cutaneous symptoms and signs associated with hypothyroidism for its early detection and treatment.

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