International Journal of Research in Medical Sciences
*Hanif MA et al. Int J Res Med Sci. 2023 Jan;11(1):1-5*
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20223294

**Original Research Article**

# Clinical presentation of hypothyroidism: a study of 50 cases

**M. Abu Hanif[1]*, A. K. M. Aminul Hoque[2], Ahsan Habib[3], Hasanul Islam[4], Amjad Hossain[5], Al Fatah Al Adilujjaman[6]**

[1]Department of Neurology, Rangpur Medical College Hospital, Bangladesh
[2]Department of Medicine, Anwar Khan Modern Medical College Hospital, Bangladesh
[3]Department of Neurology, Bangabandhu Sheikh Mujib Medical University, Bangladesh
[4]Department of Cardiology, Rangpur Medical College Hospital, Bangladesh
[5]Department of Medicine, Shaheed Suhrawardy Medical College Hospital, Bangladesh
[6]Department of Medicine, Rangpur Medical College Hospital, Bangladesh

**Received:** 20 September 2022
**Revised:** 04 December 2022
**Accepted:** 05 December 2022

***Correspondence:**
Dr. M. Abu Hanif,
E-mail: hanifneuro@gmail.com



## ABSTRACT

**Background:** When the thyroid gland does not produce and release enough thyroid hormone into your circulation, it is known as hypothyroidism. Your metabolism becomes slower as a result. Hypothyroidism, also known as an underactive thyroid, can make you feel exhausted, put-on weight, and have trouble with cold weather. In utero, throughout infancy, during youth, or even during maturity, it may begin to develop. The frequency of unanticipated overt hypothyroidism varies from 1 to 18 cases per thousand persons when accompanied by biochemical and clinical symptoms of hypothyroidism. The aim of the study was to observe the various clinical presentations of hypothyroidism

**Methods:** This cross-sectional observational case-based study was conducted at the institute of nuclear medicine, Dhaka medical college hospital, Dhaka, Bangladesh. The study duration was 6 months, from January 2005 to July 2005. A total of 50 patients attended at the study place during the study period who were biochemically hypothyroid were included in the study.

**Results:** The age range of the patients was 13 months to 54 years with a mean age of 29.5 years in this series. The majority of the patients were between 20 to 49 years of age. Female comprises 80.0% in comparison to 20.0% of male cases of hypothyroidism. Spontaneous primary (idiopathic) hypothyroidism (90.0%), post-radioiodine therapy, and post-ablative hypothyroidism were the most important causes of hypothyroidism in this series. Most typical symptoms and signs of hypothyroidism were found in this study. The most common symptoms were generalized weakness, lethargy, slowness of activities, impairment of memory, loss of scalp hair, somnolence, dry skin, puffiness of the face, constipation, weight gain, hoarseness of voice, swelling of the body, decreased sweating and paraesthesia. Cases of idiopathic hypothyroidism and other types had similar symptoms. The mean duration of symptoms before medical consultation was 2.9 years. Dry and coarse skin topped the list of physical findings and was present in 60.0% of the cases. Other findings in order of frequency include goiter (56.0%), puffiness of the face (38.0%), cold and thick skin (44.0%), thick tongue (24.0%), peripheral edema (24.0%), Anemia (20.0%), pallor of the face (12.0%), bradycardia (08.0%), thick lips (4.0%), ascites (2.0%) and pericardial effusion (2.0%).

**Conclusions:** Although in the present series a limited number of patients were included, it encompassed varieties of cases. Moreover, an attempt was made to evaluate the common presentation, age incidence, sex distribution, and laboratory status of hypothyroidism in our country, giving more emphasis on clinical findings.

**Keywords:** Thyroid, Hypothyroidism, Serum, TSH, T3, T4, Idiopathic

## INTRODUCTION

A clinical condition known as hypothyroidism is when there is not enough thyroid hormone circulating in the blood to sustain healthy bodily function. It may start developing in utero, during infancy, childhood, or even adulthood. When combined with biochemical and clinical signs of hypothyroidism, the frequency of unexpected overt hypothyroidism varies from 1 to 18 instances per thousand people. According to several epidemiological research, the ratio of women to men with hypothyroidism ranges from 2:1 to 8:1.[1,2] In a survey of 2,779 persons carried out in County Durham, England, hypothyroidism was detected in 1.9% of women and was overt in 1.4%. The prevalence in men was less than 0.1 percent.[2] Recent surveys indicate hypothyroidism to be more prevalent in the elderly population reaching as high as 20%.[3] A study of the Framingham population showed that 5.9% of the women and 2.4% of men above the age of sixty had serum TSH levels more than 10 mU/l.[4] While in Ireland the prevalence of primary hypothyroidism has been stated as 8.6% in women above the age of fifty years as compared to only 0.9% in younger females.[5] The incidence of congenital hypothyroidism was reported to be 1 in 2,640 in a study from India.[6] The exact information about hypothyroidism in our country is not known. A study done by Chowdhury et al revealed that 69.6% of their hypothyroid cases were due to spontaneous hypothyroidism and 26.8% were due to goitroushypothyroidism.[7] In iodine-replete areas, autoimmune thyroid disease and thyro-ablative therapy are the major reasons for hypothyroidism. Even in children and adolescents' autoimmune thyroiditis is the commonest cause of non-endemic thyromegaly and acquired hypothyroidism.[8] However, worldwide, iodine deficiency is the leading cause.[9] The clinical manifestations of hypothyroidism are variable depending upon its cause, duration, and severity. The spectrum extends from subclinical to overt hypothyroidism to myxedema coma. The classic change is the slowing of physical and mental activities and all the body systems. Hoarseness of voice (71.4%), loss of appetite (64.3%), constipation (64.3%), cold intolerance (58.9%), progressive weight gain (57.0%), dry skin (83.9%), delayed ankle jerk (69.6%) and puffy face with a depressed look (62.5%) were the important symptoms and signs reported by Chowdhury et al.[7] The characteristic pathological finding in a hypothyroid patient is the accumulation of hyaluronic acid and other glycosaminoglycans in the interstitial tissues.[10] A high degree of suspicion is thus required to appreciate the clinical manifestations of the disorder to reach a diagnosis. Unfortunately, there is very little information available on this subject from our part of the world.

### *Objectives*

Objectives were to find out the pattern of symptoms of hypothyroidism, to find out the pattern of signs of hypothyroidism.

## METHODS

This cross-sectional observational case-based study was conducted at the institute of nuclear medicine, Dhaka medical college hospital, Dhaka, Bangladesh. The study duration was 6 months, from January 2005 to July 2005. A total of 50 patients admitted at the study place during the study period who were biochemically hypothyroid were included in the study. Informed written consent was obtained from all the participants, and ethical clearance was also obtained from the ethical review committee of the study hospital. A thorough history was taken from each patient (and relatives where necessary) and a complete physical examination was done for each of the patients personally to obtain maximum possible information regarding the pattern of symptoms, duration of symptoms, and presence of clinical signs. Physical findings were rechecked with the findings of doctors of INM dealing with thyroid cases to avoid any observer error. The data of each patient was recorded in a printed form and analyzed. Hypothyroidism was diagnosed when serum T3 and T4 were below the lower limit and THS above the normal limit. Other investigations like an anti-thyroid antibody, chest X-ray, electrocardiogram, echocardiogram, serum cholesterol, and radioiodine uptake were done when presenting the feature demanded.

### *Inclusion criteria*

Patients aged between 1-60 years, biochemically diagnosed hypothyroid cases and patients who had given consent to participate in the study were included.

### *Exclusion criteria*

Secondary hypothyroid cases, geriatric patients, unable to answer the criteria question and exclude those affected with other chronic diseases etc. were excluded.

## RESULTS

Among the participants, the majority (30%) belonged to the age group of 20-29 years, while 22% were between 40-49 years of age and 20% were between 50-59 years of age. The age range of the participants was 1-54 years, and the mean age was 29.5 years. 80% of the participants were female, with a male: female ratio of 1:4. For 90% of the participants, the cause of their hypothyroidism could not be determined (idiopathic), with 4% having hypothyroidism due to radioactive iodine therapy, another 4% due to thyroidectomy, and 2% due to anti-thyroid drug usage.

Multiple symptoms of hypothyroidism were present in the majority of the participants, with the most common symptoms being weakness (96%), slowness of activity (94%), lethargy (90%), weight gain (84%), hair falling (78%), memory impairment (76%), swelling of the body (74%), paresthesia (70%), somnolence (66%) and dry skin (60%).

**Table 1: General characteristics of participants (n=50).**

| Variables | N | Percentage (%) |
|---|---|---|
| **Age (Years)** | | |
| 1-9 | 1 | 2 |
| 10-19 | 5 | 10 |
| 20-29 | 15 | 30 |
| 30-39 | 8 | 16 |
| 40-49 | 11 | 22 |
| 50-59 | 10 | 20 |
| **Mean age (Years)** | 29.5±SD | |
| **Age range (Years)** | 01-54 | |
| **Gender** | | |
| Male | 10 | 20 |
| Female | 40 | 80 |
| **Cause of hypothyroidism** | | |
| Idiopathic | 45 | 90 |
| Radioactive iodine therapy | 2 | 4 |
| Anti-thyroid drug | 1 | 2 |
| After thyro-idectomy | 2 | 4 |

**Table 2: Distribution of participants by frequency of symptoms, (n=50).**

| Symptoms | N | Percentage (%) |
|---|---|---|
| **General weakness** | 48 | 96 |
| **Slowness of activity** | 47 | 94 |
| **Lethargy** | 45 | 90 |
| **Weight gain** | 42 | 84 |
| **Loss of scalp hair** | 39 | 78 |
| **Memory impairment** | 38 | 76 |
| **Swelling of body** | 37 | 74 |
| **Paresthesia** | 35 | 70 |
| **Somnolence** | 33 | 66 |
| **Dry skin** | 30 | 60 |
| **Hoarseness of voice** | 27 | 54 |
| **Constipation** | 25 | 50 |
| **Loss of appetite** | 23 | 46 |
| **Puffiness of face** | 19 | 38 |
| **Slow speech** | 18 | 36 |
| **Decreased sweating** | 18 | 36 |
| **Muscle shiftiness, myopathy** | 17 | 34 |
| **Cold intolerance** | 15 | 30 |
| **Menorrhagia** | 8 | 20 |
| **Diminished libido** | 7 | 14 |

In the present series, the duration of symptoms prior to medical consultation ranged from months to years. The earliest was 1 month and the longest was 9 years. The average period of symptoms before medical consultation was 2.9 years. The majority had symptoms of hypothyroidism (40%) for less than 1 year.

**Table 3: Duration of symptoms in the hypothyroid patient before medical consultation, (n=50).**

| Duration of symptoms (Years) | N | Percentage (%) |
|---|---|---|
| **0-1** | 20 | 40 |
| **1-2** | 13 | 26 |
| **2-3** | 3 | 6 |
| **3-4** | 7 | 14 |
| **4-5** | 4 | 8 |
| **More than 5** | 3 | 6 |

**Table 4: Physical findings in hypothyroid patients, (n=50).**

| Physical findings | N | Percentage (%) |
|---|---|---|
| **Dry and coarse skin** | 30 | 60 |
| **Goiters** | 28 | 56 |
| **Cold skin** | 22 | 44 |
| **Puffiness of face** | 19 | 38 |
| **Delayed relaxation of ankle jerk** | 14 | 28 |
| **Thick tongue** | 12 | 24 |
| **Peripheral edema** | 12 | 24 |
| **Loss of eyebrow** | 11 | 22 |
| **Anemia** | 10 | 20 |
| **Pallor of skin** | 6 | 12 |
| **Thick lips** | 2 | 4 |
| **Ascites** | 1 | 2 |
| **Pericardial effusion** | 1 | 2 |

Dry and coarse skin topped the list and was present in 30 cases (60%). The next common physical findings were goiter, in 28 cases (56%), puffiness of the face in 19 cases (38%), and coldness of skin in 22 cases (44%).

**Table 5: Laboratory evaluation of hypothyroidism, (n=50).**

| Laboratory investigations | N | Value range | Mean value | Normal value |
|---|---|---|---|---|
| **Serum total T3 (nmol/l)** | 40 | 0.00-1.21 | 0.59 | 1.23-3.54 |
| **Serum total T4 (nmol/l)** | 50 | 0.93-53.0 | 21.45 | 54-173 |
| **TSH (MIU/l)** | 50 | 7.3-100 | 54.34 | 0.3-5.0 |
| **RAIU 2 hours (%)** | 2 | 4-8 | 6.80 | 4-8 |
| **RAIU 24 hours (%)** | 2 | 13-25 | 14.30 | 8-25 |
| **Hb% (gm%)** | 10 | 8-12.5 | 10.2 | 14.5-16.5 |

The Table 5 shows the value range and means values of different serums and their normal value. All forms of serum values were not measured from all 50 cases. Mean values of serum T3, T4, and Hb% were lower compared to normal values, while mean TSH levels of 50 cases

were significantly higher than normal values. RAIU at 2 hours and RAIU at 24 hours were within normal range.

**Table 6: Distribution of cases in different T4 and TSH levels, (n=50).**

| Serum types | N | Percentage (%) |
|---|---|---|
| **Total serum T4 (nmol/l)** | | |
| <1 | 1 | 2 |
| 1-20 | 10 | 20 |
| 20-40 | 20 | 40 |
| 40-60 | 13 | 26 |
| 60-80 | 6 | 12 |
| **Serum TSH level (MIU/l)** | | |
| 10-20 | 5 | 10 |
| 20-40 | 7 | 14 |
| 40-60 | 8 | 16 |
| 60-80 | 27 | 54 |
| 80-100 | 1 | 2 |
| >100 | 2 | 4 |

Serum T4 and TSH values were measured for all 50 cases, and it was observed that a wide variation of T4 values existed among participants, but very few had normal T4 values. In the majority of patients (40%), T4 varied from 20-40 nmol/l. Only 12% had serum T4 of over 60 nmol/l. TSH varied from 7.15 to 100 MIU/l. In the majority of patients 27 cases (54%), TSH varied from 60-80 MIU/l. The mean TSH level in 50 cases was 54.34 MIU/l.

**Table 7: Comparison of serum levels between idiopathic and miscellaneous groups, (n=50).**

| Causes | Mean T3 (nmol/l) | Mean T4 (nmol/l) | Mean TSH (nmol/l) |
|---|---|---|---|
| **Idiopathic, (n=45)** | 0.59 | 21.37 | 55.9 |
| **Radioiodine therapy, (n=2)** | 0.304 | 31.09 | 33.97 |
| **Anti-thyroid drug, (n=1)** | 1.51 | 32.46 | 33.97 |
| **Post-op, (n=2)** | 0.95 | 68.46 | 52.7 |

Comparing the mean values of T3, T4, and TSH with causes of hypothyroidism, it was observed that mean T4 was lower among idiopathic cases compared to other types of hypothyroid cases. Conversely, the mean TSH level higher among idiopathic cases compared to others.

## DISCUSSION

The clinical presentations of hypothyroidism are one of the most insidious of all diseases and sometimes symptoms are present for years before a diagnosis is confirmed. Milder forms of the disease often escape diagnosis because of vague and non-specific symptoms and signs. In the present series, the clinical pattern of 50 cases of hypothyroidism was studied with particular reference to age incidence, sex distribution, frequencies of symptoms and signs, etiological factors, and results of laboratory investigations. The age range of the patients studied in this series were 13 months to 54 years with a mean age of 29.5 years. Incidence of hypothyroidism varied in different age groups. The majority of the patients in this series belonged to the age group of 20-49 years. (68%). This high prevalence of hypothyroidism among those over the age of 20 was supported by the findings of other studies.[7] The male: female ratio in the present study was 4:1, which was almost similar to the findings of the Saudi-Arabian study.[11] In this series, spontaneous primary hypothyroidism (idiopathic) was the main cause of hypothyroidism, observed in 45 patients (90%).Two patients (4%) developed hypothyroidism after total thyroidectomy due to thyroid malignancy and another 2 patients (4.0%) developed hypothyroidism due to radioiodine therapy. In this series, only one patient (2%) developed hypothyroidism due to treatment with anti-thyroid drugs. The present series observed a large number of patients showing multiple symptoms, where general weakness, slowness of activities, lethargy, loss of scalp hair, memory impairment, swelling of the body, paresthesia, and somnolence were the most common symptoms. Almost all patients had a general weakness. The prevalence of different types of weakness was similar to the findings of other global studies.[12] Other common symptoms were impairment of memory in 38 (76%) cases, loss of scalp hair in 39 (78.0%) cases, somnolence in 33 (66.0%) cases, muscle Stiffness, and myopathies in 17 (34.0%) cases. some less frequent but important symptoms are decreased libido in 7 (14%) cases and menorrhagia in 8 (20%) cases. The duration of symptoms prior to medical consultation to the current study varied from 1month to 9 years, with an average of 2.9 years. A maximum number of patients (40%) attended medical consultation within 1 year of onset of symptoms. The duration of symptoms in the current series was quite long in comparison to other studies in developed countries. This long duration of symptoms prior to medical consultation in the current series was most probably related to the poor socioeconomic condition of the patient's lack of awareness as well as the unavailability of medical facilities. Some of the patients were treated inadequately and irregularly by local health personnel, leading to delays in diagnosis. Financial constraints also played a part in this delay. The physical finding of hypothyroidism was variable and depend on the stage of the disease. In the current series, common physical signs obtained during the first visit were dry and course skin, present in 30 (60%) cases. This was similar to the study of Al-Sultan et al.[11] In a few of the cases, major variations of physical presentations were observed, which might be due to the duration of symptoms. Among the 50 cases of the present series, only 4% were diabetic. The frequency of hypothyroidism among diabetic patients

varies from 0.7% to 4.0%.[13] Serum total T4 was estimated in all patients and T3 in 40 cases in this series. Serum total T3 was found to vary from 0.00 to 2.15 nmol/l (normal range 1.25 to 3.54 nmol/l. With a mean of 0.59 nmol/l. This was also consistent with the findings of Al-Sultan et al.[11] The range of serum total T4 in the current series was found to vary from 0.93 to 69.00 nmol/l with a mean of 21.45 nmol/l. Significant elevation of serum TSH levels was found in the study patients and a negative correlation was found between serum TSH levels and T4 and T3 levels. The range of TSH varied from 7.3 to >100 miu/l with a mean of 54.34 miu/l. The mean serum total T4 (21.45 nmol/l) and mean serum TSH (54.34 miu/l) found in this series were consistent with the reported T4 and TSH by Al-Sultan et al.[11] They found the mean T4 26.00 nmol/l and mean TSH 64.2 miu/l in their study. The slight difference may be due to the difference in the number of patients studied.A total of 2 patients had undergone the radioactive iodine uptake (RAIU) test. The value of 2 hours RAIU varied from 4-8% with a mean of 6.8% and the value of 24 hours RAIU varied from 13 to 25% with a mean of 14.3%. The normal range of 24 hours RAIU was considered to be between 15 and 45% in our nuclear medicine laboratories. This test has been becoming less popular for the diagnosis of thyroid disorder. Serum cholesterol was done only in 5 patients and the value was found to vary from 173 to 318 mg%. (normal value 150- 200 mg%) with a mean of 220 mg%. In three patients, serum cholesterol was found more than 250 mg% and in another two patients, it was within the normal range.

### *Limitations*

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

## CONCLUSION

The study showed that hypothyroid generally occurs from the age of 20, and has a high prevalence among the female population. The majority of hyperthyroid cases go undiagnosed and are recognized as idiopathic. General weakness, lethargy, weight gain etc., are some of the most common clinical presentations.

*Funding: No funding sources*
*Conflict of interest: None declared*
*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Hanif MA, Hoque AKMA, Habib A, Islam H, Hossain A, Al Adilujjaman AF. Clinical presentation of hypothyroidism: a study of 50 cases. Int J Res Med Sci 2023;11:1-5.