



Prevalence of Depression Among Newly Detected Hypothyroid Patients Attending a Tertiary Care Hospital in Bangladesh

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Abstract

Background: Hypothyroidism is the most prevalent endocrine disorder worldwide. In patients with endocrine diseases, a high prevalence of mood disorders in general and particularly major depression (MD) has been commonly found, especially in thyroid diseases. Aim of the study: A descriptive, cross-sectional study was conducted from January 2021 to December to estimate the prevalence of depression among hypothyroid patients in Satkhira Medical College hospital a tertiary care hospital in Satkhira, Bangladesh. A total of 115 patients were included and analyzed in this study. **Material & Methods:** A cross-sectional study was conducted to estimate the prevalence of depression among hypothyroid patients in a tertiary care hospital in Bangladesh. Patients were screened for depression using the Patient Health Questionnaire-9 screening tool, obtaining their sociodemographic data, details of their thyroid function status, and other risk factors for depression. Also, used patient medical files were to get the laboratory results. Data were analyzed using the Statistical Package for the Social Science (SPSS) version 23. Continuous data were displayed using mean and standard deviation; categorical data were expressed in numbers and percentages. The Chi-square test was used to assess the relationship between the variables. A P value of less than 0.05 was considered statistically significant. **Results:** This is a descriptive cross-sectional study; 115 patients were enrolled and analyzed in this study. The mean age was 42.05 ± 11.49 years, ranging from a minimum of 23 years to a maximum of 72 years. The majority of patients were females (94.78% of patients were female and 83.9% of patients were male, respectively). Two-thirds of patients were married, 76(66.09%) and 64(55.65%) carried bachelor's or diploma degrees, and only 8(6.96) % were illiterate. More than three quarters, 81(70.43%), were non-working [Table 1]. Met a higher percentage of depressed patients among those who experienced stressful life events, with no statistically significant association [Table 5]. **Conclusion:** Depression was prevalent among hypothyroid patients, and screening for depression among hypothyroid patients is recommended.

Keywords:- Depression, Hypothyroid &Tertiary.

INTRODUCTION

Thyroid dysfunction and depressive illness have been reported for a long time.^[1] The role of the thyroid gland in primary depressive

disorder is yet unrevealed.^[2] The prevalence of hypothyroidism in the developed world is about 4-5%; in India, it is 10.95%, and in Bangladesh, it is 10-12%.^[3,4,5] General treatment goals for hypothyroidism are the reversal of



clinical progression and the correction of metabolic derangements as evidenced by normal blood levels of TSH and free T₄; if thyroid function test becomes routine, the features of depression disappear gradually, and the patient needs no antidepressant drugs or other interventions. As a treatable condition with a high prevalence that causes significant suffering, we feel that a greater emphasis is on recognizing the association of depression with hypothyroidism and treating hypothyroidism to prevent the development of depression. Multiple factors may lead to depression in hypothyroid patients, for instance, chronic disease, sociodemographic factors, stressful life events, level of thyroid-stimulating hormone (TSH), change in dose of levothyroxine, and some medications.^[6] A study conducted in southern Brazil in 2009 estimated the prevalence of depression among chronic disease patients to be 16.2%. Depression is higher among women, older individuals, widowed or divorced, hospitalized patients, and patients with low socioeconomic status.^[6] Stressful life events have been shown to increase the prevalence of depression.^[7] The serum TSH level was associated with the severity of depressive symptoms in hypothyroid patients, and levothyroxine hormone replacement therapy was found to improve depression in hypothyroidism.^[8] Symptoms of hypothyroidism such as weight gain and hair loss have been shown to increase the risk of depression, whereas overweight and obese tend to have a higher risk of depressive symptoms than those with average weight.^[9] Complaints of hair loss, especially among adult female patients, were associated with a greater prevalence of depression.^[10] Some medications have been shown to increase the risk of

depression, such as β -blockers, corticosteroids, and isotretinoin, yet the nature of those effects is yet to be understood.^[11,12,13] Around 10% of patients on corticosteroids will experience severe psychiatric adverse effects, ranging from depression to psychosis and delirium.^[11] Isotretinoin has been shown to increase the risk of developing depression among patients.^[12] β -blocker medications that cross the blood-brain barrier increase the risk of developing neuropsychological symptoms, such as drowsiness, fatigue, and lethargy.^[13] There are limited studies conducted to estimate the prevalence of depression among hypothyroid patients worldwide, especially in Bangladesh; all studies focused on the hypothyroid status rather than screening them for depression.

Objectives

The study aimed to estimate the prevalence of depression among newly detected hypothyroid patients attending a tertiary care hospital in Bangladesh to assess the relationship between depression and different factors.

MATERIAL AND METHODS

A descriptive, cross-sectional study was conducted from January 2021 to December to estimate the prevalence of depression among hypothyroid patients in Satkhira Medical College hospital a tertiary care hospital in Satkhira, Bangladesh. A total of 115 patients were included and analyzed in this study.

Inclusion criteria:

- Patients were calculated according to Epi Info.
- We included patients of either sex above the age of 18 years.

- The patients were diagnosed with hypothyroidism either due to high TSH levels (more than 4.94 uIU/mL) and low T3 or T4 levels (T3 less than 1.71 pg/mL, T4 less than 0.7 ng/dL) or due to low TSH (less than 0.35 IU/mL) and low T3 or T4.

Exclusion criteria:

- Patients younger than 18 years.
- Patients with a personal or family history of psychiatric disorder.
- Patients with serious medical illnesses
- Patients with cancer and chronic kidney disease

All data were presented in a suitable table or graph according to their affinity. A description of each table and diagram was given to understand them clearly. All statistical analysis was performed using the statistical package for social science (SPSS) program and Windows. Continuous parameters were expressed as mean \pm SD and categorical parameters as frequency and percentage. The student's t-test made comparisons between groups (constant parameters). The Chi-Square test compared definite parameters. The significance of the results, as determined by a 95.0% confidence interval and a value of $P < 0.05$, was considered statistically significant.

RESULTS

This is a descriptive cross-sectional study; 115 patients were enrolled and analyzed in this study. The mean age was 42.05 ± 11.49 years, ranging from a minimum of 23 years to a maximum of 72 years. The majority of patients were females (94.78% of patients were female and 83.9% of patients were male, respectively). Two-thirds of patients were married,

76(66.09%) and 64(55.65%) carried bachelor's or diploma degrees, and only 8(6.96) % were illiterate. More than three quarters, 81(70.43%), were non-working [Table 1]. Regarding the time of diagnosis, more than one-third of the patients (35.65%) were diagnosed after more than ten years, while nearly one-third (32.17%) were diagnosed more than 2 to less than ten years. Normal TSH levels were encountered among 57.39% of the patients, while elevated TSH levels were reported in 35.65%. More than three quarters reported measuring TSH level every 3–6 months (79.13%). Almost all the study samples were on thyroxine replacement therapy except for two cases, of whom more than two-thirds (68.70%) were on levothyroxine dose between 25 and 100 μ g daily and 26.09% were on an amount between 125 and 175 μ g daily, and only 5.22% were on a high dose between 200 and 350 μ g daily. Nearly three quarters needed to change the quantity, either increase (40.87%) or decrease (31.30%) [Table 2]. Regarding symptoms of hypothyroidism, the highest percentage was encountered among fatigue, hair loss, and weight gain (86.09%, 78.26% and 73.04%, respectively) [Figure 1]. According to PHQ-9, as shown in [Figure 2], it is found that only 37.39% of the hypothyroid patients were depressed, ranging from moderate depression (10.43%) to moderately severely depressed (20.00%) to severely depressed (3.48%). Nearly one-fifth (17.39%) of the patients had diabetes mellitus [Figure 3], and regarding the use of some medications that might cause depressive symptoms, it was reported that a majority or nearly all patients did not use such medications [Table 4]. The highest percentages of depressed hypothyroid patients were encountered among working patients (35.9%) and single patients (41.03%), with no statistically significant



association between depression and occupation or marital status [Table 3]. The highest percentages of depressive patients were mostly encountered among those with elevated TSH levels (41.03%), those with a dose of levothyroxine between 125 and 175 µg daily

(30.77%), and those who needed to increase their quantity (48.72%) [Table 4]. A higher percentage of depressed patients was met among those who experienced stressful life events, with no statistically significant association [Table 5].

Table 1: Distribution of the hypothyroid patient according to sociodemographic data (N=115).

Characteristics	Frequency	Percentage
Gender		
Male	6	5.22
Female	109	94.78
Marital status		
Married	76	66.09
Single	27	23.48
Divorced	10	8.70
Widow	2	1.74
Education		
Illiterate	8	6.96
Elementary	10	8.70
Intermediate	10	8.70
High school	16	13.91
Bachelor/diploma	64	55.65
Retired	4	3.48
Postgraduate	6	5.22
Occupation		
Nonworking	81	70.43
Working	34	29.57

Table 2: Distribution of the hypothyroid patient according to the timing of diagnosis TSH level and treatment.

Characteristics	Frequency	Percentage
Time of diagnosis		
<6 months	10	8.70
6 months-2 years	27	23.48
>2 years-10 years	37	32.17
>10 years	41	35.65
TSH level		
Normal	66	57.39
High	41	35.65

Low	8	6.96
Frequency of measuring TSH		
<3 months	8	6.96
Every 3-6 months	91	79.13
>6 months	16	13.91
Dose (µg)*		
25-100	79	68.70
125-175	30	26.09
200-350	6	5.22
Change in dose*		
No change	32	27.83
Increase	47	40.87
Decrease	36	31.30

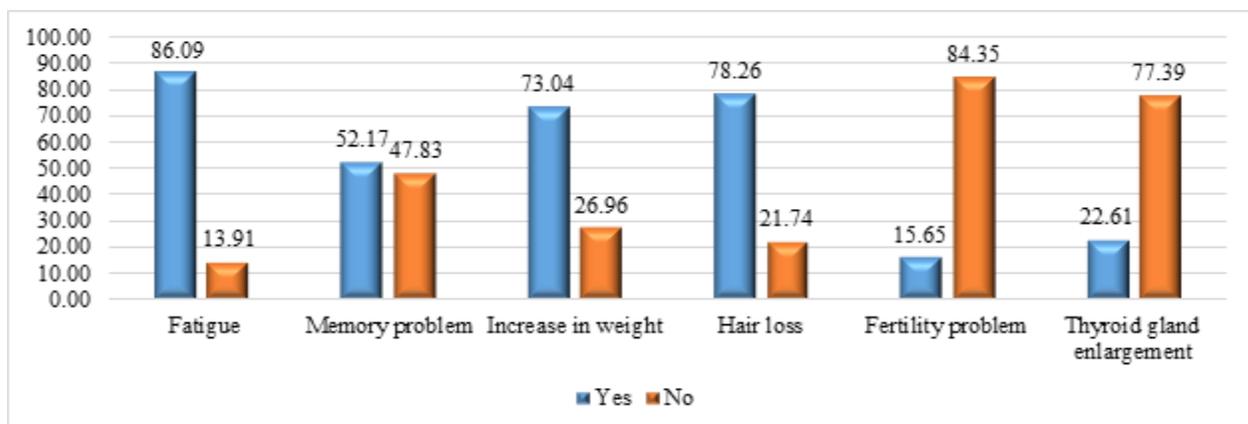


Figure 1: Symptoms of hypothyroidism.

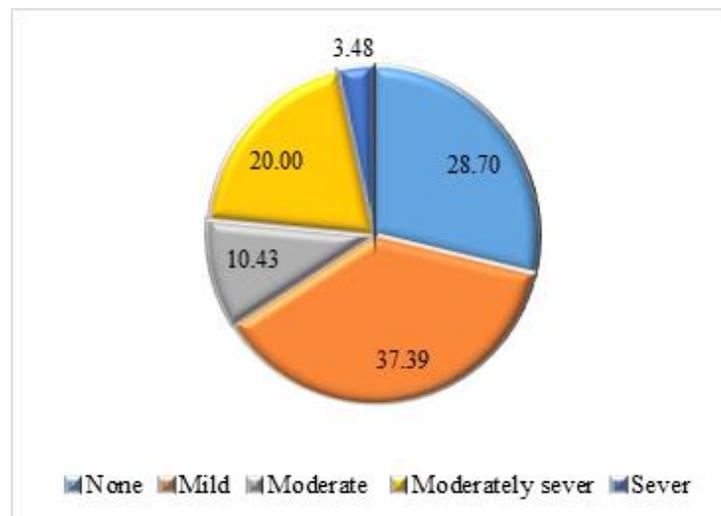


Figure 2: Hypothyroid patient according to depression level.

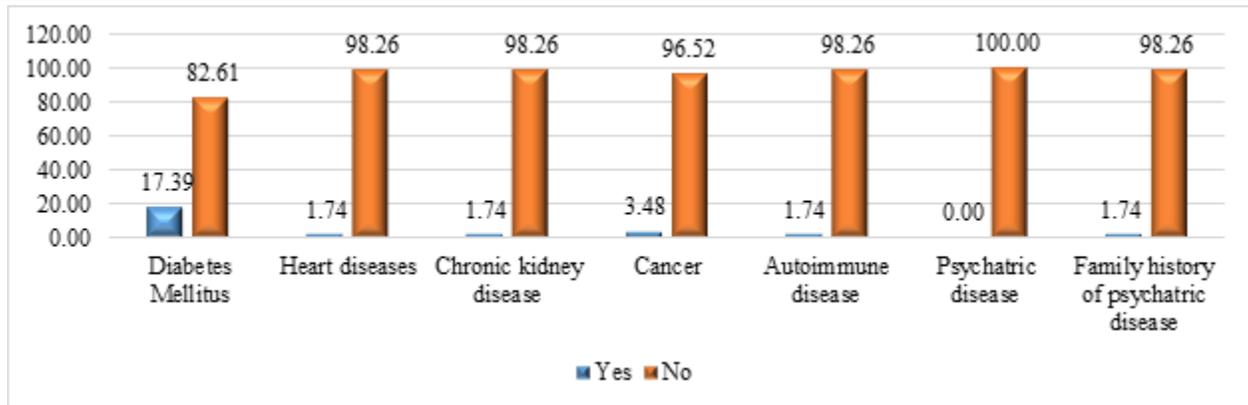


Figure 3: Medical diseases among hypothyroid patients

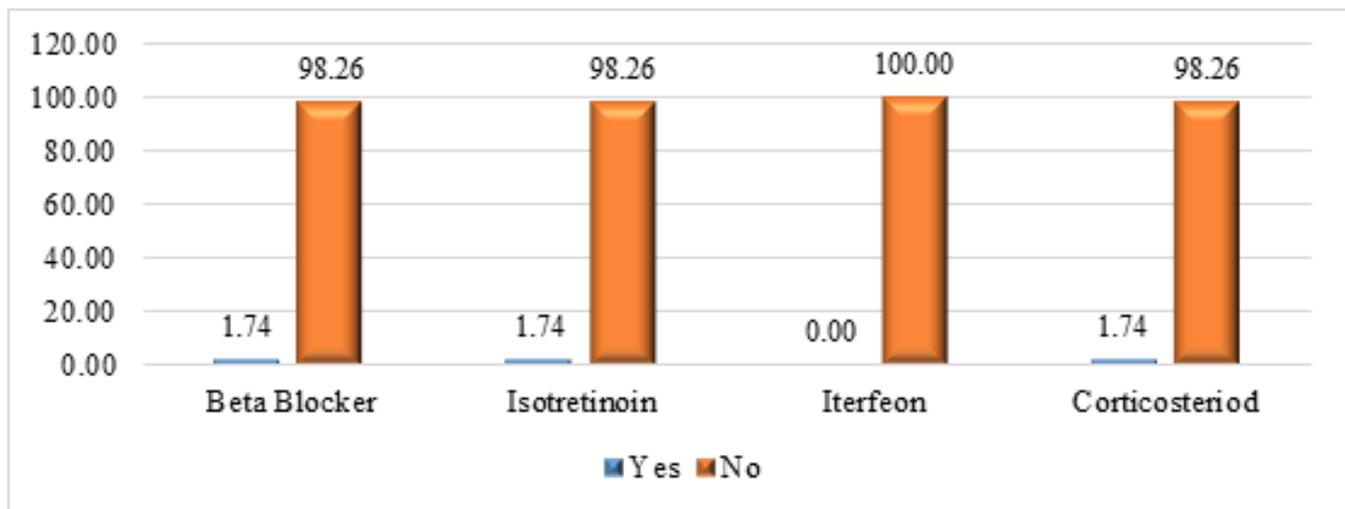


Figure 4: Medications used causing depression among hypothyroid patients.

Table 3: Association between depression in hypothyroid patients and occupation marital status (N=115).

Sociodemographic characteristics	Non-depressed (N=76)		Depressed (n=39)		P-value
	N	%	N	%	
Occupation					
Not working	54	71.05	25	64.10	0.202
Working	18	23.68	14	35.90	
Retired	4	5.26	0	0.00	
Marital status					
Single	10	13.16	16	41.03	0.244
Married	58	76.32	19	48.72	
Divorced	6	7.89	4	10.26	
Widowed	2	2.63	0	0.00	

Table 4: Association between depression in hypothyroid patients and hypothyroidism-related characteristics.

Hypothyroidism-related characteristics	Non-depressed (N=76)		Depressed (n=39)		P-value
	N	%	N	%	
TSH level					
Normal	45	59.21	21	53.85	0.179
High	25	32.89	16	41.03	
Low	6	7.89	2	5.13	
Dose (µg)*					
25-100	54	71.05	25	64.10	0.11
125-175	18	23.68	12	30.77	
200-350	4	5.26	2	5.13	
Change in dose*					
No change	23	30.26	8	20.51	0.298
Increase	31	40.79	19	48.72	
Decrease	22	28.95	12	30.77	

Table 5: Association between depression in hypothyroid patients and stressful life conditions.

Stressful life conditions	Non-depressed (N=76)		Depressed (n=39)	
	N	%	N	%
Stress				
No	29	38.16	12	30.77
Yes	47	61.84	27	69.23

DISCUSSION

Depression is a common problem encountered among hypothyroid patients worldwide. This study was conducted in a Tertiary Care Hospital in Bangladesh to address the prevalence of depression among newly detected hypothyroid patients and to correlate it with different factors such as certain sociodemographic factors, TSH level, symptoms of hypothyroidism, and stressful life events. The study included 115 hypothyroid patients; the majority were female, with a mean age of 42.05±11.49 years. Depression was found in 33.9% of the sample, ranging from average 10.7%, moderately severe 19.6%, to severe depression 3.6%. The worldwide prevalence of

depression among hypothyroid patients was estimated to be around 12.5% in India in 2016;^[14] in the United States; 5% in 2018,^[15] and 2% in the United Kingdom in 2013.^[16] Differences in prevalence can be attributed to different sample sizes, gender, and other socioeconomic characteristics between different studied populations. The highest percentages of depressed hypothyroid patients were encountered among working and single patients with no statistically significant association between depression and occupation or marital status. Similarly, to our study results, an Indian study conducted in 2017 found that 50% of depressed patients were unmarried.^[17] This study showed a positive association between hypothyroid symptoms and



depression. Our findings suggested that a high prevalence of depression is found in patients with fatigue, followed by hair loss and weight gain. However, only a statistically significant association was found between depression and fatigue, memory problems, hair loss, and gland enlargement. Whereas memory loss was the only statistically significant feature seen in depressed patients in the Indian studied population.^[17] Even though the majority of depressed patients mostly encountered those with high TSH levels, those with a dose of thyroxin between 125 and 175 µg daily, and those who needed to increase their dose, this study showed no statistically significant association between depression and TSH levels, thyroxin dose, or change in thyroxin dose. Differently from our study, a study by Naseem et al. showed a significant association between higher TSH levels and the prevalence of depression.^[17] Another study by Guimarães et al. showed a statistically significant association between TSH levels of >10 mUI/mL and the presence of depressive symptoms.^[17] These studies' results have limited generalization ability due to the differences in the sample characteristics. In our current study, although most of the depressed patients were met among those who experienced stressful life events such as family problems (e.g. death of a relative or

marital separation), economic, social and emotional problems, educational obstacles, and pregnancy, it showed no statistically significant association between stressful life events and depression. This indicates that patients who were found to have depressive symptoms are more likely to be due to hypothyroid-related causes rather than other confounders such as stressful life events.

Limitations of the study:

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

CONCLUSIONS

The study results estimated the prevalence of depression among hypothyroid patients and highlighted the most common symptoms associated with depression. A prevalence of 33.9% was found, accounting for one-third of the sample, which is considered prevalent and consistent with the stated hypothesis. In conclusion, hypothyroid patients are predisposed to depression independently of their TSH level or other risk factors such as socioeconomic issues. A population-based study is needed for a more precise estimation of the prevalence of this disease.

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