

# Psychiatric Morbidity in Hypothyroid Patients

N. L. Dinker<sup>1</sup>, Shruti Sharma<sup>2</sup>

## ABSTRACT

**Introduction:** The causal relationship between hypothyroid and psychiatric disorders is well established. The high psychiatric morbidity, especially depression (28-50%) and anxiety disorders (30-40%) are prevalent in hypothyroid patients. Aims was to study psychiatric morbidity in Hypothyroid patients.

**Material and Methods:** A total of 100 diagnosed Hypothyroid patients attending Endocrinology clinic of a tertiary care hospital and 100 normal healthy relatives of patients were evaluated before commencement of treatment by Hamilton Rating Scale for Depression, Hamilton Anxiety Scale and the formal psychiatric interview. The clinical diagnosis was made as per International Classification of Diseases. The data were analyzed by Z-test to test the statistical significance.

**Results:** The clinical evaluation revealed that statistically significant number of patients (table-2) suffered from psychiatric diagnostic entity namely Moderate Depressive episode-35 % (40% females and 20% males), Generalized Anxiety disorder-31% (33.33 females and 24% males), sexual disorders -28% (52% males and 20% females) and suicidal ideations- 40% (46.66% females and 20% males).

**Conclusions:** The more females suffered from depression (40% vs 20%), generalized anxiety disorder (33.33% vs 24%) and suicidal ideations (46.66% vs 20%) than males. However, the males suffered more from sexual disorders (52% vs 20%). In conclusion, the females suffered more from psychiatric disorders than males.

**Keywords:** Depression, Anxiety, Sexual disorders, Suicidal Ideations.

## INTRODUCTION

The hypothyroid patients may initially present with major psychiatric features.<sup>1</sup> The hypothyroid patient may be misdiagnosed as primary psychiatric disorder due to its predominant psychiatric manifestations.<sup>2,3</sup> The relation between hypothyroidism and psychiatric manifestations is frequent most of the times. The causal relationship for psychiatric manifestations of hypothyroid is often missed due to its multifarious and intricate clinical presentation.

The psychiatric problems, in a hypothyroid patient which can manifest are depression, organic mental disorders and psychosis mainly manifesting with predominant paranoid features.<sup>4</sup>

The various psychiatric manifestations due to hypothyroid are cognitive disorders (forgetfulness, mental slowness and inattention), emotional lability, depression and various types of hallucinations namely auditory, visual and gustatory.

However, no relationship has been established between degree of hypothyroid state and further development of psychiatric morbidity.<sup>5,3</sup>

The hypothyroid patient can often be misdiagnosed as a psychiatric disorder. Hence, a comprehensive medical evaluation is required to detect features which may help in conformation of hypothyroidism.<sup>4</sup> It is evident from above that hypothyroid can present with any psychiatric disorder. In view of the above, it was considered proper to perform the clinical study of hypothyroid patients to know psychiatric morbidities in hypothyroid patients.

Aims and objectives of the study were to study the psychiatric morbidity in hypothyroid patients and to compare the prevalence of psychiatric morbidity in males and females hypothyroid patients.

## MATERIAL AND METHODS

The approval for ethical clearance from the review board of local institutional ethical committee has already been obtained on 29/07/2015.

The following criteria were used for selection of patients for the study:-

- 1 The patients were not suffering from any other physical illness except hypothyroid.
- 2 The patients did not have any past history of psychiatric disorders.

The study was carried out at the Endocrinology clinic of a large tertiary care hospital. The patients were studied before commencement of treatment. The clinical diagnosis of hypothyroid was made by Endocrinologist and its confirmation by evaluation of TSH, T<sub>3</sub> and T<sub>4</sub> blood levels. The study group constituted every newly diagnosed hypothyroid patients and the control group constituted the 100 healthy relatives of patients (nearly matching with age and sex of hypothyroid patients).

All patients were assessed in a common protocol via a formal psychiatric interview. Psychiatric history and mental status examination were recorded on a specially designed proforma. The International Classification of Diseases (ICD-10) diagnostic criteria were used in making the clinical diagnoses.

<sup>1</sup>Associate Professor, Department of Psychiatry, <sup>2</sup>Assistant Professor, Department of General Medicine, SRMS IMS, Bareilly - 243202, India

**Corresponding author:** Dr. N. L. Dinker, MD, Associate Professor, Department of Psychiatry, SRMS IMS, Bareilly- 243202, Bhojipura, Bareilly (UP), India.

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The standardized psychological tests administered to the patient were:-

Hamilton Rating Scale for Depression (HRSD)<sup>6</sup> Hamilton Anxiety scale (HAS).<sup>7</sup>

## STATISTICAL ANALYSIS

The analysis of collected data was carried out using SPSS package and preliminary tables generated were used as baseline data to find out the effect of hypothyroid in causation of psychiatric morbidity. The difference between two proportions (hypothyroid patients sample proportion and control sample proportion) were evaluated by Z-test. The differences were considered significant if the *P* value was < 0.05.

## RESULTS

The demographic characteristics (age and sex, and educational status) of hypothyroid patients are presented in table 1. Mean age of the patients was 39.56 years. The range of age was 21 to 60 years. The details of patients in age group

Age group (in years)	Male (%)	Female (%)	Total percentage
21-30	05(20)	15(20)	20%
31-50	15(60)	45(60)	60%
51-60	05(20)	15(20)	20%
Total	25(100)	75(100)	100%
Education Status			
<10	10(40)	35(46.66)	45%
10-12	10(40)	25(33.33)	35%
Graduation	05(20)	15(20)	20%
Total	25(100)	75(100)	100%

**Table-1:** Demographic Profile of 100 Hypothyroid Patients

wise revealed (20% males and 20% females in 21-30 years age group, 60% males and females in 31-50 years age group, 20% each in males and females in group 51-60 years age). Details of total patients in each group revealed (20% in 21-30 years age group, 60% in 31-50 years age group and 20% in 51-60 years age group).

The sex distribution revealed 25% males and 75% females. Educational status revealed that most of the patients (45%) had studied <10 standard, 35% up to 10-12 standard and 20% were graduate.

**Moderate Depressive Episode:** In our study, 35% hypothyroid patients (as per ICD-10 criteria) suffered from statistically significant (*P* value-0.000) moderate depressive episode (table 2) which was more and statistically significant among females than males (40% vs. 20%).

Evaluation by Hamilton Rating Scale for Depression (table 3) revealed depression in 61% (mild depression-29%, moderate depression-27% and severe depression-05% patients). It also revealed more and statistically significant (*P* value 0.000) in females than males (64% vs 52%). The severity level was also higher and statistically significant (*P* value – 0.000) among the females than males i.e. -mild depression (30.66% vs 24%), Moderate depression (30.66 vs 16%). However, severe depression was more common and statistically significant (*P* value– 0.000) among males than females (12% vs 02.66%).

**Generalized Anxiety Disorder:** In our study, 31% hypothyroid patients (as per ICD-10 criteria) suffered from statistically significant (*P* value-0.000) generalized anxiety disorder (table 2) which was more and statistically significant among females than males (33.33% vs. 24%).

Evaluation by Hamilton Anxiety Scale scores (table 4) re-

Psychiatric disorders	Hypothyroid Patients			Control			Z- test	
	Male N=25	Female N=75	Total N=100	Male N=25	Female N=75	Total N=100	Z	P
Moderate Depressive Episode	05(20%)	30(40%)	35%	01(04%)	04(05.33%)	05%	5.30	0.000-S
Generalized Anxiety Disorder	06(24%)	25(33.33%)	31%	03(12%)	08(10.66%)	11%	3.47	0.000-S
Suicidal Ideations	05(20%)	35(46.66%)	40%	03(12%)	02(02.66%)	05%	5.93	0.000-S
Sexual Disorders	13(52%)	15(20%)	28%	02(08%)	04(05.33%)	06%	4.14	0.000-S
Male Erectile Disorder	08(32%)	NA	08%	02(08%)	NA	02%		
Premature Ejaculation	02(08%)	NA	02%	NIL	NA	00%		
Delayed Ejaculation	NIL	NA	00%	NIL	NA	00%		
Hypoactive Sexual Desire Disorder	03(12%)	15(20%)	18%	NIL	04(05.33%)	04%		

Z- test- Z- test of significance; P-P Value; Z- Z Value; S-Significant: NA- Not Applicable

**Table-2:** Psychiatric Disorders Among 100 Hypothyroid Patients

Depression Scores	Hypothyroid Patients			Control			Z-Test	
	Male N=25	Female N=75	Total N=100	Male N=25	Female N=75	Total N=100	Z	P
0-7(No Depression)	12(48%)	27 (36%)	39%	16(64%)	68(90.66%)	84 %	6.54	0.000(S)
8-12 (Mild)	06(24%)	23 (30.66)	29%	06(24%)	04(5.33%)	10%	3.39	0.000(S)
13-15 (Moderate)	04 (16%)	23 (30.66%)	27%	02(08%)	03(04%)	05%	4.24	0.000(S)
16 or more (Severe)	03 (12%)	02 (02.66%)	05%	01(04%)	00(0.00%)	01%	3.21	0.000(S)

**Table-3:** Distribution of depression scores on Hamilton Rating Scale for Depression

vealed anxiety in 47% (mild anxiety -13%, moderate anxiety -27% and severe anxiety -07% patients). It also revealed more and statistically significant anxiety ( $P$  value 0.000) in males than females (48% vs 46.66%). However, the severity level was higher and statistically significant ( $P$  value – 0.000) among the females than males i.e. – Moderate and severe anxiety (40% vs 16%). However, mild anxiety was more common in males than females (32% vs 06.66%) but it was not statistically significant ( $P$  value– 0.157) in comparison to controls .

**Suicidal Ideations:** The study also revealed (table 2) that 40% ( $P$  value-0.00) patients expressed suicidal ideations (46.66% females and 20% males).

**Sexual Disorders:** In addition to above, a considerable and statistically significant number of patients also suffered (table 2) from sexual disorders- 28% ( $P$  value 0.000) viz 52% males and 20% females.

## DISCUSSION

Table-2 shows that clinically (ICD-10) present study revealed a considerable amount of psychiatric disorders (66%) in hypothyroid patients (Moderate depressive episode in 35% and Generalized anxiety disorder in 31%). In addition to above, a significant number of hypothyroid patients also suffered from other psychiatric morbidities (Sexual disorders- 28% and suicidal ideations-40%).

**Moderate Depressive Episode:** The disturbances in mood/depression are more common among hypothyroid patients. However, thyroid functions are usually normal in depressed patients.<sup>8</sup>

The connection between hypothyroid and depression is well known and even mild cases of low thyroid function can cause major depression.<sup>1,9</sup> Depressive affect has been reported as a frequent association with hypothyroid (Whybrow et al.1969) and a regular feature of early case series.<sup>10</sup>

In our study, 35% hypothyroid patients (as per ICD-10 criteria) suffered from moderate depressive episode (table 2) and 61% depression (mild depression-29%, moderate depression-27% and severe depression-05% patients) on Hamilton Rating Scale for Depression (table 3).

The moderate depressive episode (table 2) was more common and statistically significant ( $P$  value – 0.000) among females than males (40% vs. 20%). The evaluation by Hamilton Rating Scale for Depression (table 3) also revealed that

more females than males (64% vs 52%) had depression. The severity level was also higher and statistically significant ( $P$  value – 0.000) among the females than males i.e. -mild depression (30.66% vs 24%), Moderate depression (30.66 vs 16%). However, severe depression was more common and statistically significant ( $P$  value– 0.000) among males than females (12% vs 02.66%).

Our study also supports the findings of other researches where depression has been reported in 28% to 50 % of the sample (3, 11).

**Generalized Anxiety Disorder:** The various studies<sup>12,13</sup>, have revealed that the incidences of anxiety disorders are more common in most of the hypothyroid patients.

In our study, 31% hypothyroid patients (as per ICD-10) suffered from Generalized Anxiety Disorder (Table-2) and the evaluation by Hamilton Anxiety Scale (table 4) revealed 47% anxiety disorder (mild anxiety-13%, moderate anxiety-27% and severe anxiety-07%).

The generalized anxiety disorder (table-2) was more common and statistically significant ( $P$  value – 0.000) among females than males (33.33% vs. 24%). The evaluation by Hamilton Anxiety Scale (table-4) revealed that more males than females suffered from statistically non-significant ( $P$  value – 0.157) mild anxiety (32% vs. 06.66%) in comparison to controls, but more and statistically significant ( $P$  value – 0.000) moderate anxiety in females than males (33.33% vs. 08%).The severe anxiety was also more common and statistically significant ( $P$  value – 0.000) in males than females (08% vs. 06.66%). Our study is consistent with the findings of other researchers where anxiety disorders were reported in 30 to 40% of the sample.<sup>14,15,16</sup>

**Sexual disorders:** In our study, 28% hypothyroid patients suffered from sexual disorders (table-2) and revealed more and statistically significant ( $P$  value – 0.000) sexual disorders in males than females (52% vs. 20%).

The detailed evaluation (table-2) also revealed more hypoactive sexual desire disorder in females than males (20% vs. 12%). The other sexual disorders in males were male erectile disorder (32%) and premature ejaculation (08%). The total of hypoactive sexual desire disorder and male erectile disorder was 44% but there was not a single case of delayed ejaculation. It is stressed that all the sexual disorder cases were from moderate depressive disorder and generalized anxiety disorder and not a separate entity.

A multicentre study on the prevalence of sexual symptoms in male hypothyroid patients by Carani C et al<sup>17</sup>, the preva-

Anxiety scores	Hypothyroid Patients			Control			Z-Test	
	Male N=25	Female N=75	Total N=100	Male N=25	Female N=75	Total N=100	Z	P
No anxiety	13 (52%)	40 (53.33%)	53%	20(80%)	67(89.33%)	87%	5.24	0.000(S)
0-21 (Mild)	08 (32%)	05 (06.66%)	13%	02(08%)	05(06.66%)	07%	1.41	0.157(NS)
22-35 (Moderate)	02 (08%)	25 (33.33%)	27%	03(12%)	02(02.66%)	05%	4.24	0.000(S)
36 or more (Severe)	02 (08%)	05 (06.66%)	07%	00(00%)	01(01.33%)	01%	2.11	0.030(S)

NS = Not Significant

**Table-4:** Distribution of anxiety scores on Hamilton Anxiety Scale

lence of hypoactive sexual disorder, delayed ejaculation and erectile dysfunction was 64.3% and premature ejaculation was 7.1 % of the cases which matches with 08% cases of premature ejaculation in our study. However, the difference of 12% in prevalence of male sexual disorders between our study and above study may be due to absence of delayed ejaculation cases in our study.

**Suicidal Ideations:** Our study (table-2) revealed that a significant number of patients (40%) expressed suicidal ideations which were more and statistically significant (P value – 0.000) in females than males (46.66% vs. 20%). However, no hypothyroid patients in our study attempted or committed suicide. All the cases who expressed suicidal ideations suffered from all the 03 disorders (moderate depressive disorders, generalized anxiety disorders and sexual disorders). The risk of suicide must also be addressed in patients suffering from an affective illness regardless of etiology. Parker reported on a patient in 1935 who while suffering from Myxoedema and depression, jumped to his death from a tall building.<sup>18</sup>

**Strengths of the study:** We have categorically inquired about suicidal ideations and complaints of sexual disorders both from male and female patients. This has given strength to our study in finding out more hypoactive sexual desire disorder among females than males (20% vs 12%) and suicidal ideations (46.66% vs 20%). The other studies have not gone in details of above morbidities especially in females.

**Limitations of the study:** Our study has assessed only emotional disorders like depression and anxiety and their related disorders namely sexual disorders and suicidal ideations. However, other psychiatric disorders like cognitive disorders (dementia and others) have not been explored due to non-application of related neuropsychological tests. The details of primary causative major psychiatric disorders like depression and anxiety for sexual disorders and suicidal ideations, the effect of duration of illness and other sociodemographic factors on psychiatric morbidity have also not been studied.

## CONCLUSIONS

The present study showed a considerable amount of psychiatric morbidity. Hence, it is recommended that a detailed psychiatric work up to be sought by treating physician in all hypothyroid patients so that preventable and treatable psychiatric morbidity is not missed as many patients may initially present only with psychiatric signs and symptoms. The timely intervention may even reverse the conditions like dementia.

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