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Research Article

**THE CROSS-SECTIONAL STUDY OF ASSOCIATION
BETWEEN DEPRESSION AND THYROID PROFILE****Dr. Ameer Hamza¹, Dr. Muhammad Zohaib Chaudhary¹, Dr. Hasnain Ahmed¹,
Rukhsar Javaid², Muhammad Waseem Abbas^{2*}**¹MBBS, Multan Medical and Dental College, Multan, Pakistan¹MBBS, Multan Medical and Dental College, Multan, Pakistan¹MBBS, Multan Medical and Dental College, Multan, Pakistan²MBBS, Nishtar Medical University, Multan, Pakistan^{2*} MBBS, Nishtar Medical University, Multan, Pakistan**Article Received:** October 2020**Accepted:** November 2020**Published:** December 2020**Abstract:**

Introduction: Depression is the leading cause of mental morbidity worldwide especially in young population. It is one of the major contributors to the disease burden globally. The high prevalence rate and chronic course of depression have caused significant mental and somatic morbidity and loss of productivity in young generation in either the case that the young person is suffering from depression or his parents.

Aims and Objective: To find out the association of thyroid disorders with unipolar and bipolar depression.

Materials and Methods: This cross-sectional study was conducted at Nishtar Medical University and Hospital (NMU&H), Multan from September 2018 to October 2018. Total 300 patients with depressive symptoms 159 unipolar and 141 bipolar cases were included. These patients were not taking any medication for at least 1 month prior to the onset of recent episode and gave written informed consent. A minimum amount of 2 ml of venous blood from each subject was required and tests included were T3, T4 and TSH.

Results: Regarding thyroid function test, 191 cases were euthyroid among which 69.05 % were females and 59.77 % were males.

Conclusion: The study concludes that thyroid function disorders were significantly found in cases of unipolar depression while most of the bipolar cases had normal thyroid status.

Key words*Depression, Thyroxine, Hyperthyroidism, Unipolar, Bipolar***Corresponding author:****Dr. Muhammad Waseem Abbas,**

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INTRODUCTION:

Depression is the leading cause of mental morbidity worldwide especially in young population. It is one of the major contributor to the disease burden globally [1]. The prevalence of depression and depressive symptoms have markedly increased in recent decades. However the lifetime prevalence of depression vary widely in different regions of world. Middle East, North Africa, South Asia and America are considered among countries having very high depression rates according to various epidemiological studies [2].

The high prevalence rate and chronic course of depression have caused significant mental and somatic morbidity and loss of productivity in young generation in either the case that the young person is suffering from depression or his parents [3,4]. Various studies revealed major depression to be about twice as common in women as in men. The relative increase in occurrence is related to pubertal development rather than chronological age, this appears to be associated with hormonal factors [5].

Thyroid gland produces and regulate thyroid hormones i.e. Thyroxine T4 and Tri-iodothyronine T3. They effect the energy levels, mood and even weight. They can also be causative factors in depression. Thyroid disorders are strongly associated with mood alterations [6].

Hypothyroidism either overt or subclinical appears to be commonest abnormality found in bipolar disorder [7]. Depression and cognitive dysfunction are the most common psychiatric symptoms related to hypothyroidism [8]. On the other hand, hyperthyroidism or thyrotoxicosis is usually associated with symptoms such as anxiety, depression, mood instability and insomnia in the majority of patients. Occasionally patients with late-onset mania are detected to have hyperthyroidism [9,10].

The objective with which this study is conducted is to find out the association of thyroid disorders with unipolar and bipolar depression in Pakistan.

MATERIALS AND METHODS:

This is a cross-sectional study conducted in a tertiary care hospital of Southern Punjab Pakistan in Nishtar Medical University and Hospital (NMU&H), Multan from September 2017 to October 2018. Patients with unipolar and bipolar depression from outpatient department and inpatient ward were selected by systemic random sampling. Total 300 patients with

depressive symptoms 159 unipolar and 141 bipolar cases were included.

Patients included were of age group 18-50 years, diagnosed with depression including both unipolar and bipolar disorders, irrespective of their genders. These patients were not taking any medication for at least 1 month prior to the onset of recent episode and gave written informed consent. Patients with co-morbid medical illness e.g. congestive heart failure, liver failure etc. on any medication in last 1 month or with any other psychiatric or neurological disorder were excluded.

We have not considered the subtypes of bipolar depression type 1 and type 2 in our study. This study included the patients on the basis of current episodes without any prior medical history or past thyroid disorders and their treatment. Discordant results were to be repeated, which was time consuming.

A semi-structured questionnaire designed according to ICD-10 diagnostic criteria for the diagnosis of depression supported by Mini-International Neuropsychiatric Interview (M.I.N.I) [11,12]. Only diagnosed cases of unipolar and bipolar depression were included. Major depressive disorders even with single episode can be specified by International Classification of Diseases ICD-10.

A minimum amount of 3 ml of venous blood from each subject was obtained as minimum of 2 ml serum or plasma was required. Test included T3, T4 and TSH. Electrochemiluminescence Immunoassay was used by the pathologists of Nishtar Lab. Interpretations of the results were according to laboratory standardized reference. Range of serum T3 (0.8-1.8 ng/ml), T4 (4.0-11 ug/dl and TSH (0.39-5 iU/ml).

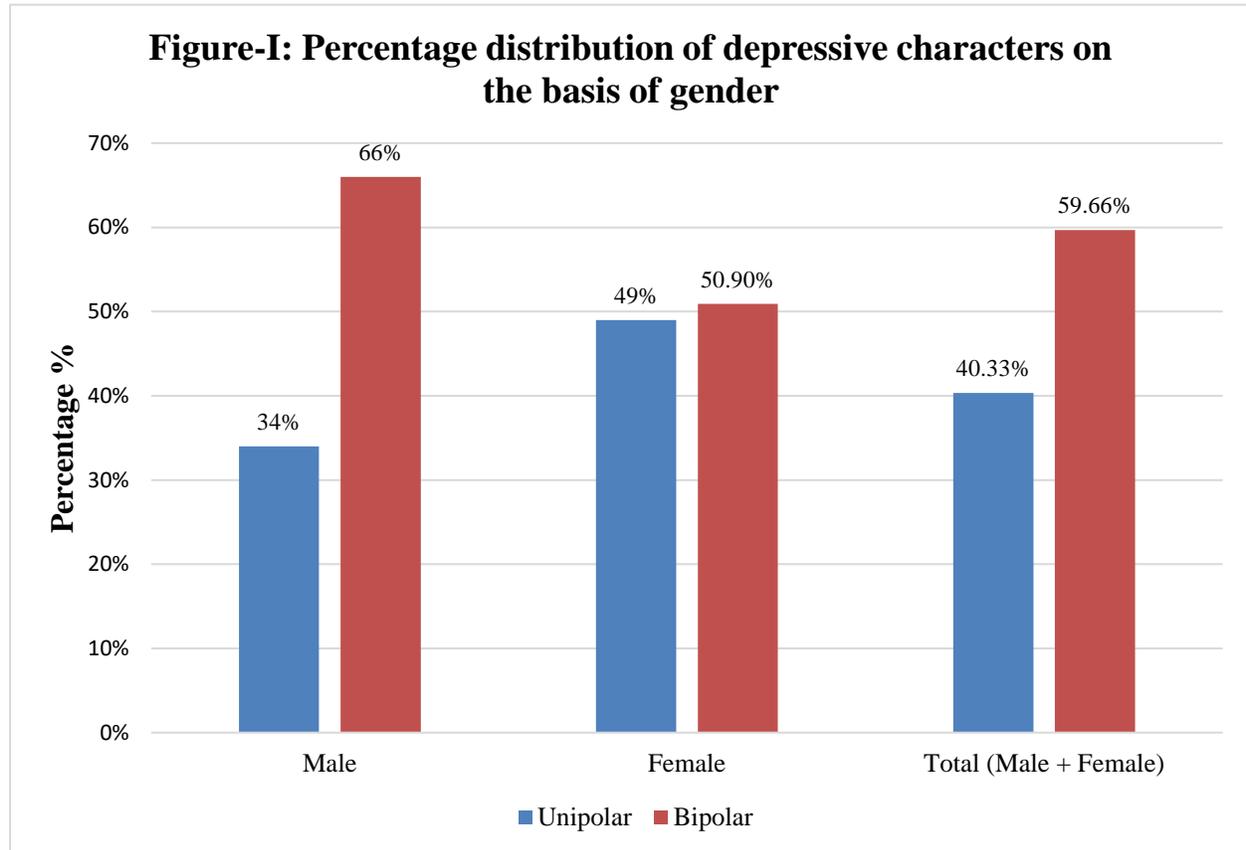
When subject is presented with normal levels of T3, T4 and TSH then the subject is labelled as euthyroid. When T3 and T4 are raised while TSH is below normal range then subject is said to be hyperthyroid. But if T3 and T4 are below normal levels while TSH is raised then the subject is hypothyroid. If the results are not in accordance with the above criteria then considered as discrepant. The observed findings were analyzed by SPSS (23.0 Version). The data were expressed in %age frequency and analyzed by Chi-square test.

RESULTS:

The study consisted of 300 subjects with male consisting 58 % of total and females 42 % including 121 unipolar cases and 179 bipolar cases. Unipolar representation was almost equal for both genders.

Male were significantly higher in the bipolar group in contrast to females comprising unipolar group. However age categories did not give significant

variations between unipolar and bipolar group. This is shown in Figure-I.



Regarding thyroid function test, 191 cases were euthyroid among which 69.05 % were females and 59.77 % were males. Unipolar cases with euthyroid status were 49.57 % while majority of the bipolar cases were euthyroid 73.18 %. Unipolar cases with hypothyroid (12.39 %) and overt hypothyroid state (9.91 %) were higher than hypothyroid (1.17 %) and subclinical hypothyroid (3.91%) in Bipolar cases. Hyperthyroid and overt hyperthyroid state were equally found in both unipolar and bipolar cases. Discordant results were twice in unipolar cases (12.39 %) than in bipolar cases (6.70 %). This is depicted in Table-I.

Females were more in hyperthyroid state and their vulnerable age group for both Unipolar and Bipolar

depression was around 20-40 years. Discordant results were more in males (10.92 %), Unipolar cases (12.39 %) and in age group <20 years (15.15 %). This is illustrated in Figure-II.

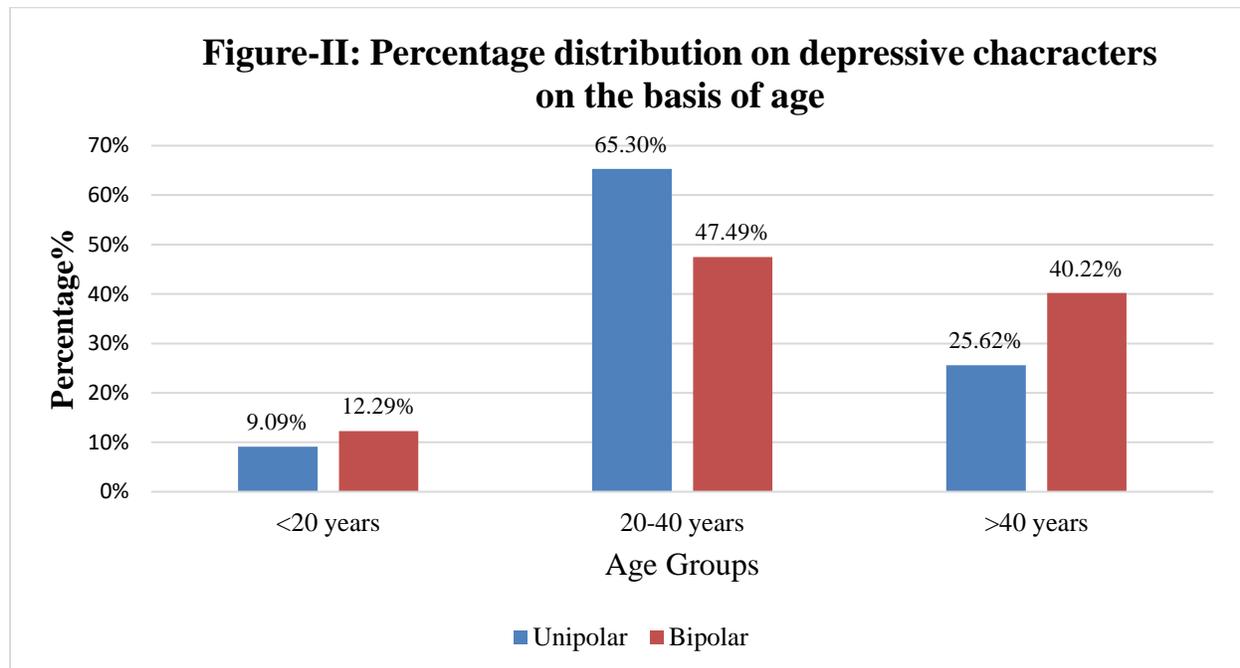
Of the total cases 63.66 % were euthyroid, 5.66 % were hypothyroid, 6.66 % hyperthyroid, subclinical hyperthyroid (8.66 %), subclinical hypothyroid (6.33 %) and 9 % were discrepant.

Above results did not show any significant associations of various characteristics as gender, age and depressive character with thyroid function status among the patients with Unipolar and Bipolar depression.

Table-I: Distribution of Thyroid profile on the basis of gender, age groups and depressive characters

Variable	Thyroid Status	Eu-T n(%)	Hypo-T n(%)	Hyper-T n(%)	Sub C Hypo-T n(%)	Sub C Hyper-T n(%)	Discord n(%)	p-value
Gender	Male	104 (59.77)	11 (6.32)	9 (5.17)	14 (8.04)	17 (9.77)	19 (10.92)	0.542
	Female	87 (69.05)	6 (4.76)	11 (8.73)	5 (3.97)	9 (7.14)	8 (6.35)	
Depressive Characters	Unipolar	60 (49.57)	15 (12.39)	11 (9.09)	12 (9.91)	8 (6.64)	15 (12.39)	0.127
	Bipolar	131 (73.18)	2 (1.11)	9 (5.02)	7 (3.91)	18 (10.05)	12 (6.70)	
Age Groups	<20 years	12 (36.36)	3 (9.09)	5 (15.51)	6 (18.18)	2 (6.06)	5 (15.51)	0.621
	20-40 years	119 (73.91)	9 (5.59)	6 (3.72)	7 (4.34)	8 (4.96)	12 (7.45)	
	>40 years	60 (56.60)	5 (4.71)	9 (8.49)	6 (5.66)	16 (15.09)	10 (9.43)	

Eu-T: Euthyroid, Hypo-T: Hypothyroid, Hyper-T: Hyperthyroid, Sub C: Sub-acute, Discord: Discordant



DISCUSSION:

In the population of our study Depression was found more commonly in males. The prevalence of Unipolar and Bipolar depression was equal in females. Whereas in males bipolar depression was more prevalent 66 %.

The prevalence of depression was maximum in age group 20-40 years 47.49 % which constitute the

youth and productive population of our society thus can lead to loss in development of nation.

Among the cases of depression both Unipolar and Bipolar, 63.66 % were euthyroid which is normal and suggest relatively less association of Depression with abnormal thyroid status. The overt cases of both Hypothyroidism (8.04 %) and Hyperthyroidism (9.77 %) were mostly males. Similarly, discordant cases

were also more in males (10.92 %) than female (6.35 %).

Comparison of thyroid status among Unipolar and Bipolar cases reveal that most Bipolar cases were euthyroid (73.18 %). The prevalence of Hypothyroidism and Hyperthyroidism was significantly higher in unipolar cases. Subclinical Hyperthyroidism was more in Bipolar cases (10.05 %) markedly. Discordant results were more in unipolar cases (12.39 %) than Bipolar cases (6.70 %). [13,14]

This study has revealed the prevalence of Unipolar and Bipolar depression in both genders and different age groups. The aim of our study was to reveal the association of Unipolar and Bipolar depression with normal and abnormal thyroid status. Unipolar depression was more linked to abnormal thyroid functioning even in overt cases. While majority of Bipolar cases (73.18 %) have normal thyroid status. [15]

CONCLUSION:

The study concludes that thyroid function disorders were significantly found in cases of unipolar depression while most of the bipolar cases had normal thyroid status yet abnormal thyroid status was also present in patients of bipolar depression. The study has also revealed prominent numbers of hypothyroidism in unipolar cases.

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