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Original Article

Association of Thyroid Dysfunction and Psychosocial Mood Disorder - Is there a Correlation

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Abstract

Objective: Aim of the study is to assess thyroid dysfunction in persons who present with symptoms of psychosocial mood disorder as of DSM-V, in a Tertiary Care Hospital of Karachi and compare them with already diagnosed cases of psychiatric illness

Methods: This case control study was done at a tertiary care hospital of Karachi, during June 2021 to September 2022. Patients between 20-60 years were recruited, either from medical OPD without psychiatric illness or from psychiatric OPD with established psychiatric illness. A predesigned questionnaire was used including demographic and physical and mental symptoms. Informed consent was taken either by the patient or the attendant, accordingly. The thyroid stimulating test was assessed on all patients. Data interpretation was done on SPSS 23, with the help of frequencies, percentages, and t-test.

Results: Among 300 patients recruited in the study 67.3% were females and 32.1% were males. The mean age among psychiatric patients was 35.96+ 12.6, while in the non-psychiatric group it was 42.95+12.03. Among 150 patients with psychiatric illness, 11.3% had deranged TSH, in comparison to 18.6% in the non-psychiatric group. The mean TSH was almost the same in both groups with an insignificant p-value of 0.648.

Conclusion: Thyroid illness may remain undiagnosed with diverse neuropsychiatric symptoms even without physical symptoms to a psychiatrist and remain on antipsychotic medication for months to years. Early diagnosis of thyroid illness can help beforehand treatment which benefit in reducing complications and morbidity.

Keywords: Psychiatric illness, non-psychiatric patients, Thyroid Stimulating Hormone

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Introduction

The thyroid gland is one of the integral components of the human anatomy and physiology pertaining to the endocrine system. Thyroid hormones and their significance in human physiology have remained a matter of debate for the last few decades. Studying past literature gives the impression that it is related to only a few systems and diseases. However, extensive research and the advent of sensitive investigations in the last decade have revealed its role in a vast area of human physiology including the cardiovascular, musculoskeletal and neuropsychiatric symptoms[1] and according to various research,[2] thyroid hormone also has pathophysiologic roles in pulmonary disorders and treatment, as well as cognitive function.[3] Furthermore it has been found to have effects on the metabolic activity of almost the entire body tissues[4] and plays a role in the development of certain cancers as well, including prostatic, breast and pancreatic cancers,[5] as well as hepatocellular carcinoma.[6]

Studies have elucidated that the thyroid hormone has a significant influence on the psychiatric stability of an individual, in addition to the psychological impacts of the thyroid hormones on different systems[7] Interestingly, a correlation has also been found between hyperthyroidism, hypothyroidism and

psychiatric manifestations including depression, anxiety, mania, and psychosis[8,9] as also concluded in a study by Hazarika J, et al in India. These findings highlight the importance of evaluation of thyroid profile in patients with psychiatric symptoms. The study assesses the prevalence of thyroid disorder in patients with depressive symptoms and a comparative analysis between unipolar and bipolar disorders. The study further showed that a prominent number of patients from the unipolar group were diagnosed with hypothyroidism.[10]

While extensive research has been conducted on the subject of the effects of thyroid disorders on major systems, there is a lack of literature on the correlation between thyroid and psychological disorders. "Psychosocial" is an umbrella term used for the psychological and social factors that influence mental health. The DSM-V defines psychosocial disorders as "A behavioural or psychological syndrome or pattern that occurs in an individual, reflects an underlying psychobiological dysfunction." The consequences of which is clinically significant distress (e.g., a painful symptom) or disability (i.e., impairment in one or more important areas of functioning)".[11] Conflicting literature is available concerning the correlation between thyroid and psychosocial mood disorders. While some literature neglects the hypothesis, others have established a relationship between dysfunction of thyroid & disorders of psychosocial type. [11-14]

This paper will expand on existing literature on the subject and evaluate to assess thyroid dysfunction in individuals presenting with symptoms of psychosocial mood disorder as of DSM-V, in a Tertiary Care Hospital of Karachi and compare them with already diagnosed cases of psychiatric illness. Therefore the main aim of the current research is to assess thyroid dysfunction in persons who present with symptoms of psychosocial mood disorder as of DSM-V, in a Tertiary Care Hospital of Karachi and compare them with already diagnosed cases of psychiatric illness.

Methods

This is a case-control study done in the Medical and Psychiatry outpatient departments of Ruth K M Pfau Civil Hospital Karachi, during the period of June 2021 to September 2022. Participants enrolled after only taking informed consent either from patients coming to medical OPD or from first relatives of patients from the psychiatric department. The sample size was calculated with the help of Open Epi software keeping an anticipated frequency of 26% in view of a study done in Chile, the estimated total sample size was 150 for each group. The IRB was taken with reference no: IRB-1402/DUHS/2021/441.

Inclusion Criteria: Recruited participants were individuals of either sex between 20-60 years attending the medical OPD with some non-specific mood derangement. Patients already diagnosed with some psychiatric illness according to DSM-V criteria, of the same age group with each gender.

Exclusion Criteria: Patients already diagnosed with thyroid or pituitary disorder or those who do not want to participate

A face-to-face interview was taken with the self-generated validated questionnaire inquiring about the basic demographic details, educational status, habituation and addiction, recent major life adverse events, and psychosocial symptoms including mood swings, lethargic feeling, anxiousness, difficulty in enjoying things and suicidal/homicidal thoughts. The questionnaire also inquires regarding physical and mental symptoms including fainting, palpitation, illness-induced anxiety, altered sleep habits, and menstrual problems.

Thyroid-stimulating hormone (TSH) was assessed in all patients. Data was entered and analyzed using Statistical Package for the Social Sciences (SPSS) version 23. Frequencies and percentages were computed for categorical responses, while a t-test was used to measure associations between quantitative variables. A p-value of less than 0.05 was taken as statistically significant.

Results

Out of 300 participants recruited in the study, 50% had established psychiatric illness for more than one year. Among them 202 (67.3%), were females and 32.7 % were males. The age range was 20-60 years with a mean age of 39.50+ 12.91. The mean age among patients with psychiatric illness was 35.96+ 12.6 while in non-psychiatric illness it was 42.95+ 12.03. Most of the patients included in the study were married and uneducated. Only 18% did higher qualifications. Despite being uneducated only 20% were involved in different habituation or addiction. Regarding symptoms, most of the symptoms assessed were more marked among patients without psychiatric illness except difficulty in enjoying things with a significant p-value of 0.01, and a lack of concentration, a p-value of 0.036, which is more seen among the non-psychiatric group (table 1). Among clinical presentations generalized body aches, a p-value of 0.033, and altered bowel habits with an insignificant p-value of 1.000 was more in non-psychiatric participants (table 2).

Table 1: *Frequency of different parameters of history among both groups*

History	Psychiatric illness(YES)	Psychiatric Illness(NO)	Non-psychiatric illness (YES)	Non-psychiatric illness (NO)	p-value
Life event in past 3 months	0	150 (100%)	4 (2.6%)	146 (97.3%)	0.004
Hopelessness on trivial things	106 (70.6%)	44 (29.3%)	128 (85.3%)	22 (14.7%)	0.002
Recent Mood swings	68 (45.3)	82 (54.7%)	99 (66%)	51 (34%)	0
Difficulty in enjoying things	124 (82.6%)	26 (17.3%)	104 (69.3%)	46 (10.2%)	0.007
Lack of concentration	95 (63.3%)	55 (36.7%)	77 (51.3%)	73 (48.7%)	0.036
Difficulty in recalling things	66 (44%)	51 (34%)	64 (42.6%)	99 (66%)	0.076
Feeling of anxious	109 (72.6%)	41 (27.3%)	143(95.3%)	7 (4.6%)	0
Loosening of temper	101 (67.3%)	57 (38%)	49 (32.6%)	93 (62%)	0
Suicidal/Homicidal thoughts	13 (8.7%)	137 (91.3%)	11 (7.3%)	139 (92.7%)	0.672

Table 2: *Frequency of various symptoms among both groups*

Clinical features	Psychiatric illness (YES)	Psychiatric illness (N0)	Non-psychiatric illness (YES)	Non-psychiatric illness (NO)	p-value
Fainting	51 (34%)	99 (66%)	27 (18%)	123 (82%)	0.002
Palpitation	79 (52.6%)	71 (47.3%)	99 (66%)	51 (34%)	0.019
Body aches	136 (86.7%)	14 (9.3%)	145 (96.7%)	5 (3.3%)	0.033
Illness induced anxiety	114 (76%)	36 (24%)	96 (64%)	54 (36%)	0.023
Dizziness	54 (36%)	96 (64%)	129 (86%)	21 (14%)	0
Altered sleep	66 (44%)	84 (56%)	66 (44%)	84 (56%)	1
Altered bowels	27 (18%)	123 (82%)	63 (42%)	87 (58%)	0
Change in weight	17 (11.3%)	133 (66.7%)	28 (18.7%)	122 (81.3%)	0.076

Among 150 patients with psychiatric illness, 11.3% had deranged thyroid stimulating hormone levels as compared to 18.6 % in the non-psychiatric group. The mean TSH in psychiatric patients was 2.07± 0.33, while in non-psychiatric patients it was 2.09 ± 0.42, with an insignificant p-value of 0.648 (table 3).

Table 3: *Thyroid stimulating hormone levels among both groups*

	TSH <0.4 mIU/L	TSH 0.4-4.0 mIU/L	TSH >4.0 mIU/L
Psychiatric illness	3(2%)	133 (88.6%)	14 (9.3%)
Non-psychiatric illness	7 (4.6%)	122 (81.3%)	21 (14%)
Total	10 (3.3%)	255 (85%)	35 (23.3%)

Discussion

The thyroid hormone is one of the most important hormones for the development of the brain with the highest expression of thyroid hormone receptors compared to other organs. Neurons are highly sensitive to thyroid abnormalities than any other cells.[15] The relationship between thyroid illness and psychiatric symptoms was first reported in 1888,[16] and again seven decades ago 14 hypothyroid were labelled as myxedema madness.[17] With an alteration of thyroid hormone patients will not only have physical changes but often have emotional and mental health changes. These changes are manifested both by overactive or underactive thyroid function. Common psychiatric symptoms with hyperthyroid include anxiety, while with hypothyroid depression, feelings of lethargy are more common than anxiety. Other common features include mood swings and sleep disturbances. More serious symptoms among both states include difficulty with concentration, short-term memory loss, lack of interest and mental alertness.[18,19] All these presentations might present in patients with psychiatric disorders as well. The same pattern we observed in our study as well with feelings of depression and mood swings were more marked in non-psychiatric patients, while lack of concentration and difficulties in enjoying things were more significant in psychiatric patients. According to most of the literature, around 40% of clinical hypothyroid may present with depression.[20] In patients with

subclinical hypothyroid depression is common and may show negative effects of antidepressants.[21]

Many of the patients with thyroid illness end up with psychiatrists due to features mimicking the psychiatric illness. The severity of the presenting complaints usually reflects the severity of the illness, both for hypo or hyperthyroid. We have conducted this study to ascertain the cause of thyroid illness among patients who have been treated with antipsychotics. Most of the patients assessed in this study were euthyroid in both psychiatric and non-psychiatric patients. This association is also endorsed by a cross-sectional study done among 335 patients, which also has no relationship between thyroid illness and psychiatric patients.[22]There is some association of cognitive impairment in subclinical hypo and hypothyroid states, more marked among females. [23] Cognitive impairment is also more significant in the elderly and in demented patients with thyroid illness. It is advisable to screen all patients with dementia by doing TSH as an initial workup,[24] although we could not find such a relationship among our patients.

The prevalence of thyroid abnormalities among psychiatric patients ranges between 6% to 49%. [25] In the current study there is a positive correlation between thyroid illness and psychiatric illness in 11.3% of patients with thyroid illness. As compared to patients without psychiatric illness 18.6% had thyroid-related diseases. The same association is also seen in another study with a prevalence of 7.5% in psychiatric patients.[26] Out of 11.3% of patients 2% had hyperthyroid and 9.3% had a hypothyroid illness, which is also correlating with the general population in whom hypothyroid is more prevalent than hyperthyroid among the general population. [27]The same pattern is seen in non-psychiatric patients as well, hypothyroid is more than hyperthyroid. The limitation of the study was started during the period of the ongoing COVID-19 pandemic, which made it difficult to finish the study in one year as already planned.

Conclusion

Thyroid illness may present with a myriad of neuropsychiatric symptoms even without physical symptoms to a psychiatrist and remain on antipsychotic medication for months to years. It is imperative for psychiatrists to understand thyroid illnesses and do prompt laboratory assessments to establish the correct diagnosis. Prompt and accurate diagnosis of thyroid diseases allows for timely treatment which assists in combating complications and morbidity.

Ethical Approval: The IRB/EC approved this study via letter no. IRB-1402/DUHS/Approval/2021/441. Dated: June 21, 2021.

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Authors' Contribution

RJ: Conception

SHAN,HA: Design of the work

MU,MM,MR: Data acquisition, analysis, or interpretation

RJ,MU,MM,MR: Draft the work

SHAN,HA: Review critically for important intellectual content

All authors approve the version to be published

All authors agree to be accountable for all aspects of the work

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