

PREVALENCE OF HYPOTHYROIDISM IN FEMALES WITH DEPRESSIVE DISORDER

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ABSTRACT

OBJECTIVE

To determine the prevalence of hypothyroidism in females with depressive disorder.

STUDY DESIGN

Descriptive Cross-sectional study

PLACE AND DURATION OF STUDY

This study was conducted at the Institute of Psychiatry, Baqai Medical University Hospital, Karachi.

SUBJECTS AND METHODS

This study was conducted after seeking approval from the Ethical Review Committee of Baqai Medical University Hospital and College of Physicians and Surgeons of Pakistan. Female patients with depressive disorder were included in this study. Two (2) cc blood sample of each patient was collected to measure the level of thyroid stimulating hormone (TSH). It was analyzed by Enzyme-linked immunosorbent assay (ELISA) on the mono-bind kit of Bio Rad USA.

RESULTS

Mean \pm SD of age was 38.45 ± 7.56 with C.I (37.11--39.78 years. Mean \pm SD of BMI was 25.131 ± 6.46 with C.I (23.99--26.26) kg/m². In distribution of hypertension, 105 Patients (83%) had a history of hypertension while 21 (17%) were normal. The Hypothyroidism was found in 32 (25%) patients.

CONCLUSION

Patients with hypothyroidism commonly manifest features of depression. Hypothyroidism presents with a wider spectrum of neuropsychiatric symptoms, including both depression and anxiety.

KEY WORDS

Hypothyroidism, Depressive disorder, Thyroid hormones, Females

INTRODUCTION

Thyroid hormone has a profound influence on the brain development in humans. Hypothyroidism is a clinical condition in which the thyroid gland does not produce enough thyroid hormone. It can either be low levels of triiodothyronine (T3) and thyroxine (T4) (overt hypothyroidism) or elevated levels of the thyroid stimulating hormone (TSH; subclinical hypothyroidism)¹. In about 9.4% of the adult population prevalence of overt- hypothyroidism is 0.4% and sub-clinical hypothyroidism is 9%; in Pakistan prevalence of hypothyroidism is 4.1%. Women are more likely to develop hypothyroidism than men, with the difference being significant after 34 years of age^{2,4}.

A common cause of hypothyroidism is too little iodine in the diet due to this body cannot manufacture thyroxine. Another cause of hypothyroidism with sufficient iodine is the autoimmune condition Hashimoto's thyroiditis⁵. Hypothyroidism can produce a number of symptoms such as tiredness, sensitivity to cold, weight gain and dry skin. Furthermore, association between psychiatric illness and thyroid function has long been recognized. It ranges from mild depression and anxiety to psychosis. Approximately 60% patients with hypothyroidism are found to have anxiety disorders while 31 to 69% with hypothyroidism displayed depressive disorder. Both excess and insufficient thyroid hormone has a significant effect on a person's mood. Overt hypothyroidism was found in 1- 4% of patients with mood disorders while sub-clinical hypothyroidism occurs in 4- 40 of these patients^{6,8}.

The prevalence of depression in the general population is 34% in Pakistan⁹. 15% depressive patients show hypothyroid states, including sub-clinical hypothyroidism and about 25-30% had abnormal response to the thyrotropin releasing hormone (TRH) stimulation test¹⁰. Research showed that 20% depressed women had hypothyroidism and 36.6% hypothyroid patients had depression¹¹. With the same line study concluded that hypothyroidism is significantly associated with depression and severe form of hypothyroidism may cause dementia. Another study reported 63.5% patients with subclinical hypothyroidism showed depressive symptoms¹².

The literature suggested that in thyroid dysfunction, depression remains the most common condition therefore depression must be ruled out in clinical or subclinical hypothyroidism. Local data on this issue is very limited, so there is a need to do more research and broadcast the importance of screening for hypothyroidism in Pakistani population. The findings of this study will help to develop appropriate strategies to reduce the co-morbid conditions.

SUBJECTS AND METHODS

Participants

The sample of the present research consisted of 126 females. It was calculated on the basis of the prevalence of hypothyroidism found as 20% in females with depression³, confidence level 95%, absolute precision as 7% and the sample size required was 126 females with depression. The sample was collected through non-probability Consecutive sampling technique. Inclusion criteria were defined as;

- Females aged between 19-65 years
- All females with the score of >7 on Hamilton rating scale for depression (HAM-D).
- Duration of depressive disorder should be more than two weeks.

Following exclusion criteria were applied

- Known cases of hypothyroidism
- Females with known co-morbid conditions like chronic renal failure, coronary heart disease and autoimmune disease.
- Known case of diabetes mellitus
- Pregnant and lactating females (based on history)
- Patients taking lithium
- Severe psychiatric co-morbidity like acute psychotic disorder, catatonia and schizophrenia.

Instruments

Basic information, history of hypertension and body mass index was recorded on proforma. Then 2 cc blood sample of each patient was collected to measure the level of thyroid stimulating hormone (TSH). It was analyzed by Enzyme-linked immune sorbent assay (ELISA) on the mono-bind kit of Bio Rad USA. All the data was entered in pre-designed proforma by the Principal investigator.

Procedure

The study was conducted after seeking approval from the Ethical Review Committee of Baqai Medical University Hospital Karachi and College of Physicians and Surgeons of Pakistan. Patients were selected from the Institute of Psychiatry, Baqai Medical University Hospital Karachi. The purpose, procedure, risks and benefits of the study were explained, confidentiality was ensured and informed consent was taken from the patients fulfilling the inclusion criteria. Data was analyzed with SPSS version 20. Age, duration of depression, height, weight and body mass index (BMI) were presented as Mean ± SD. Frequency and Percentages were presented for history of Hypertension and Hypothyroidism. Effect modifiers like age, history of Hypertension, duration of the Depression and Body mass index (BMI) were controlled through stratification. Post stratification, Chi square test was applied taken p value ≤ 0.05 as significant.

RESULTS

Table 1 showed descriptive statistics, mean and standard deviation of age, height, weight, duration of depression and BMI. Results showed

that mean age of the sample was 38.45 years, height was 5.5, weight was 68.42, BMI was 25.13 and mean duration of depression was 27.86. Out of 126 patients 105 (83%) had history of hypertension while 21 (17%) were normal (see figure 1). Hypothyroidism was found to be 32 (25%) patients while 94 (75%) were found to be normal (see figure 2).

Table 1
Mean age, height, weight, BMI and duration of depression

Variables	N	M	SD
Age (years)	126	38.45	7.56
Height (feet)	126	5.5	2.41
Weight (Kg)	126	68.42	8.56
Duration of Depression (months)	126	27.86	12.48
BMI	126	25.13	6.46

Figure 1

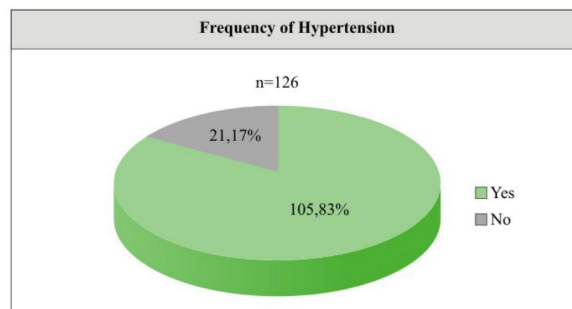


Figure 2

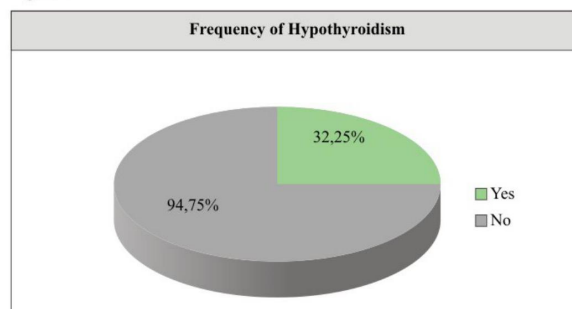


Table 2 showed stratification of age group; 32 patients were found to be hypothyroidism positive. Out of these 32 patients 10 were in age group of 19—35 and 22 in age group of 36-- 65 and p value was found to be non-significant, p = 0.542. Stratification of height showed that 18 patients with 4.7-5.3 feet and 14 patients with 5.4-5.9 feet were hypothyroidism positive, chi square was found to be non-significant, p = 0.463 (see table 2). Stratification of weight resulted in 20 patients in weight group of 48-60 kg and 12 with 61-80 kg were hypothyroidism positive, chi square was non-significant, p = 0.691 (see table 2). Duration of depression was stratified, 32 patients were found to be hypothyroidism positive. Out of these 32 patients 15 had

the duration of 2-12 months and 17 had 13 -30 months of depression. Chi square was non-significant, $p = 0.670$ (see table 2). Stratification of hypertension showed that out of 105 hypertensive patients, 20 were found to be hypothyroidism positive and 21 patients were with no history of hypertension, 12 were found to be hypothyroidism positive. Chi square was highly significant, $p = 0.0001$ (see table 2). Stratification of BMI resulted in 23 patients with 18 - 29 kg/m² were found to be hypothyroidism positive and 9 patients who were found hypothyroidism positive were having BMI >29 kg/m². Chi square was non-significant, $p = 0.225$ (see table 2).

Table 2
Chi square test after stratification of variables

Variable	Hypothyroidism		p	
	yes	no		
AGE In (years)	19-35	10	35	0.542
	36-65	22	59	
HEIGHT In (feet)	4.7 ___ 5.3	18	50	0.463
	5.4 ___ 5.9	14	44	
DURATION In (months)	2 ___ 12	15	40	0.670
	13 ___ 30	17	54	
WEIGHT In (kg)	48 ___ 60	20	55	0.691
	61 ___ 80	12	39	
HYPERTENSION	YES	20	85	0.0001
	NO	12	9	
BMI In (kg/m ²)	18 ___ 29	23	77	0.225
	>29	9	17	

N = 126

DISCUSSION

The objective of the present study was to assess the frequency of hypothyroidism in females with depressive disorder. Results showed that the frequency of hypothyroidism is 25% among women with depressive disorder. It was also observed that 65% women older than 65 years were having subclinical hypothyroidism. Furthermore, 25% of females had a TSH level greater than 4 Mu/L. This frequency is higher than that reported in the Wickham survey¹³ and the Rotterdam study¹⁴. Among all females in a sample for analysis, 2% had an unrecognized overt thyroid failure characterized by an elevated TSH level (>4.0 mU/L) and an abnormal free thyroxine level (<11pmol/L [0.9 ng/dL]), which is in agreement with reports of prevalence found during screening¹⁵. These data suggested that our sample represented by the general population to some extent. Current study suggested the association between depressive disorder and hypothyroidism, which are consistent with previous studies that also showed an association between subclinical hypothyroidism and depression in women¹⁶. However, few studies revealed a weak correlation between the subclinical hypothyroidism and depression in women¹⁷. One study by Asian S et al in 2005, reported higher levels of depressive symptoms in hypothyroid patients¹⁸.

LIMITATIONS AND SUGGESTIONS

Due to several methodological flaws in the past researches such as sample selection as including the patients having chronic resistant illness or being on psychotropic medication, this study included only drug-naïve patients having a first episode of depressive illness to overcome the nonspecific effects of chronicity of illness and pharmacological agents on thyroid functions. Most of the previous studies were conducted with controls, but in present study subjects were allocated into two groups. In one group subjects were with a first episode of depressive illness, in which thyroid profile was assessed, and in another group subjects were newly diagnosed hypothyroid patients in whom depressive status was assessed. Strengths of this study were scientific and systematic calculation of sample size, inclusion and exclusion criteria, stratification at the analysis to control for confounders and effect modifiers. Apart from these strengths there are certain limitations of this study; first, the study design was cross-sectional; therefore correlations between these variables need to be viewed with caution because it did not provide information on the causal mechanisms and the analysis and strength of evidence of which is limited and therefore the study design does not require any prior sample size calculation. Second, there were many variables and factors that have associated with predictor and outcome variables that could have been included in the study. The use of non-probability sampling also limits generalizability.

CONCLUSION




It is concluded that patients with hypothyroidism commonly manifest features of depression. Hypothyroidism presents with a wider spectrum of neuropsychiatric symptoms, including both depression and anxiety. On the other hand, most of the patients with primary depression have normal thyroid function.

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2	INAM RASOOL	Head of Department of Psychiatry, Baqai Medical University Karachi	Concept of study, supervising, Critical analysis and Proofreading.	
3	WAQAR AHMED	FCPS Trainee, Baqai Medical University Karachi	Data collection, Review of articles	
4	PIRBHO MAL MAKHIJA	Assistant Professor, Ghulam Muhammad Mahar Medical College Sukkur	Literature search, result analysis and Proofreading	