



CASE CONTROL STUDY OF SOCIO DEMOGRAPHIC DATA AND THYROID PROFILE OF PATIENTS COMING TO PSYCHIATRIC OUT PATIENT DEPARTMENT: A HOSPITAL BASED STUDY

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ABSTRACT

Background: The term endocrinological psychiatry was coined by Laignel-Lavastine, who first used it at a psychiatric congress in Dijon in 1908 when he was encouraging his colleagues to intensify research on the interaction between personality and the endocrine system.

Materials and methods: The study was conducted in the out-patient department of psychiatry, S.V.S Medical College and Hospital, Mahabubnagar, over a period of 6 months. The study sample consists of 50 consecutive patients (cases) attending to psychiatry OPD and the 50 people who do not have any psychiatric morbidity (controls).

Results: In the current study we found that there is statistically significant difference in thyroid levels in psychiatric patients and control population. In depression there is a statistically significant difference regarding the presence of thyroid dysfunction, hyper and hypothyroidism when compared with the control population.

Conclusion: thyroid disease Hyperthyroidism is significantly present in the patients of anxiety and schizophrenia, whereas hypothyroidism is present in depression, alcohol dependence syndrome and in sexual dysfunction.

KEYWORDS : anxiety disorder, depression, hyperthyroidism, hypothyroidism, mental illness.

INTRODUCTION

Mental and Behavioral disorder are common, affecting more than 25 % of all people at sometime during their lives. These are present at any point of time in about 10% of adult population. One in four families is likely to have at least one member with mental or behavioral disorder.¹

A popularly accepted three dimensional etiological model for mental illness referred to as 'biopsychosocial' has been described by Engel² and also by Susser.³ The domain of biological factors include aberrant physiology caused by heredity/genetics, sex, age, race, ethnicity, exposure to viruses, toxins, carcinogens, injury and medical treatment. The psychosocial domain includes individual differences in the aspects of cognition, mood, optimism, hostility, negative affect, stress reactivity and resources like coping, social support, religion, meaning, benefit finding.

The interaction between psycho social processes, biological factors and health behaviors like sleep, diet, exercise, sun exposure, alcohol, drugs, smoking, sexual behaviors leads to vulnerability to mental illness, its onset and symptoms progression, exacerbation, recovery with concomitant quality of life via processes involving neuroendocrine and immune mechanisms.⁴

Increasingly, scientific views of mental illness recognize that, whether caused by an identifiable anomaly (e.g., brain tumor), a neurotransmitter disturbance of unclear origin (e.g., schizophrenia), or a consequence of deranged upbringing or environment (e.g., personality disorder), all mental disorders ultimately shares one common underlying theme: aberration in brain function. The high prevalence of psychiatric morbidity among unselected samples in the community, in primary health centers and in general practice is well known.^{5,6}

Relatively few studies have attempted to evaluate the prevalence of psychiatric disorders among general medical patients. Most studies have used either specialized patient populations or specific illnesses. Davies reported a forty two percent incidence of physical disease in psychiatric out patients.⁷ Maguire and Granville found that in a series of 200 consecutive admissions to a general hospital psychiatric unit, 33.5% cases had significant physical disorder and in half of them the physical disorder was previously undiagnosed.

Various medical conditions are implicated in the causation of mental disorders which include neurological conditions like trauma,

epilepsy, vascular disorders, neoplasms, infections and systemic conditions like substrate depletion, metabolic encephalopathy, vitamin deficiencies, infections, toxins, drug exposure and endocrinopathies. The most common endocrinal disorders causing psychiatric illness are related to pituitary, thyroid, parathyroid and adrenal gland dysfunction. Among them thyroid dysfunction is most commonly seen associated with mental illness.⁸

Thyroid is a bi-lobed gland situated at the upper end of the trachea. The function of the thyroid gland is the synthesis, storage and secretion of the thyroid hormones, triiodothyronine, otherwise known as thyroxine [T4] and triiodothyronine (T3). Thyroid hormone plays a crucial role as a regulator of nervous system myelination, of growth and puberty, and of metabolism and organ functions.⁹

The psychiatric manifestations of thyroid disease have long been recognized. There is uncertainty, however, about the prevalence of thyroid disorder among the mentally ill. The present study was designed to compare and validate the incidence and prevalence of thyroid disease in mentally ill patients with different socioeconomic status.¹⁰

AIMS AND OBJECTIVES

1. To evaluate serum thyroid levels of the consecutive patients coming to Psychiatric outpatient department.
2. To evaluate the prevalence of thyroid dysfunction in various psychiatric disorders.
3. To evaluate the serum thyroid levels in control population.
4. To compare the variations in thyroid hormone levels between the two groups.
5. To compare the socio demographic profile between the two groups in relation to the thyroid status.

MATERIALS AND METHODS

This is a cross sectional hospital based comparative study. The study was conducted in the out-patient department of psychiatry, S.V.S Medical College and Hospital. This is a tertiary care hospital, providing specialist clinical care to Mahabubnagar and adjoining districts.

The present study was conducted for six months i.e., from 1st January 2012 to 30th June 2012. The study sample consists of 50 consecutive patients (cases) attending to psychiatry OPD and the 50 people who do not have any psychiatric morbidity (controls).

CRITERIA FOR SELECTION

INCLUSION CRITERIA

1. Availability of reliable informant.
2. Those who are physically fit to answer the questions.

EXCLUSION CRITERIA

1. Those taking any medication, which can produce cognitive and other psychological defect.
2. Those with other co-morbid general medical condition, those needing urgent attention for physical problems.
3. Those who did not give consent for the study.

METHODOLOGY

Patients and the control population fulfilling the selection criteria were approached and informed consent was obtained. The psychiatric diagnoses were made according to the ICD-10 criteria which were confirmed by the consultants in accordance to ICD-10 criteria.¹³⁵ Fasting thyroid levels were obtained in both the populations. Clinical and socio-demographic details were taken in both the groups of patients and controls.

Method used for estimation of serum thyroid T3,T4 and TSH levels is CLIA.

Reference values of our laboratory are as follows:

T3=0.52-1.90ng/ml.

T4=4.4-10.8microg/dl - male.

4.8-11.6microg/dl - female.

TSH=0.30-6.02 micro IU/ml.

RESULTS:

Table no -1. Comparison Of Socio Demographic Variables In Patients And Controls

VARIABLE	CASES	CONTROLS	STATISTICAL ANALYSIS
AGE	30.30±4.2	30.49±4.8	p-value-0.0016, (S)
16-30 YEARS	28(56%)	29(58%)	
31-45 YEARS	22(44%)	21(42%)	
>45 YEARS	0	0	
TOTAL	50(100%)	50(100%)	
SEX			p-value-0.1943,
FEMALE	21(42%)	18(36%)	
MALE	29(58%)	32(64%)	
TOTAL	50(100%)	50(100%)	
EDUCATION			p-value-0.0254, p-value is <0.05(S)
ILLITERATE	5(10%)	3(6%)	
<5 YEARS	18(36%)	9(18%)	
6-10 YEARS	20(40%)	10(20%)	
>10 YEARS	7(14%)	28(36%)	
TOTAL	50(100%)	50(100%)	
OCCUPATION			p-value is 0.001 value is <0.05(S)
EMPLOYED	38(76%)	50(100%)	
UNEMPLOYED	12(24%)	0(0%)	
TOTAL	50(100%)	50(100%)	
FAMILY INCOME	CASES	CONTROLS	p-value-0.7073, p-value is >0.05
<5000rs/m	37((74%)	8(16%)	
5000-10,000 rs/m	11(22%)	25(50%)	
10,000-15,000 rs/m	2(4%)	17(34%)	
>15,000 rs/m	0(0%)	0(0%)	
TOTAL	50(100%)	50(100%)	

Table no.1 shows the comparison between the socio demographic variables between the cases and controls. The mean age in the cases is 30.30±4.2 and in the controls it is 30.49±4.8. In the age group of 16-30 yrs there are 56% patients (cases) and 58% control population. There are 44% and 42% in the age group of 31-45 yrs among the cases and controls respectively. Among the cases 42% were males and 58% were females whereas in controls it is 36% and 64% respectively. With reference to education the sample were divided into four categories, illiterate, less than 5 years, 6-10 years, greater

than 10 years. The difference between the two groups with respect to different levels of education was statistically significant as shown in table no.1.

In cases about 76% and in controls 100% were employed. The difference between the two groups based on employment status is statistically significant. Depending on the family income, patients were divided into four categories. The difference between the two groups was not statistically significant. Majority of the patients in both the groups belonged to nuclear family. People living in nuclear families are about 86% in cases and 92% in controls where as it is 14% in cases and 8% in controls when coming to joint family. There was no statistically significant difference between the two groups.

Among the cases 100% and among the controls 96% are from rural locality. Only 4% among the controls were found to be hailing from an urban background and this difference is statistically significant. Since the predominant religions in the study area are Hindu and Muslim, all most all the people in the study sample were from these two groups. When duration of marital life is compared between the two groups, 82% from cases and 84% from controls are married. 18% of the cases and 16% of the controls were not married and this difference is statistically significant.

Table no-2 Prevalence Of Thyroid Dysfunction In Patients And Control Population

	CASES	CONTROLS	STATISTICAL ANALYSIS
Normal Thyroid	32(64.0%)	42(84.0%)	$\chi^2=5.99; p<0.05$
Abnormal Thyroid	18(26.0%)	8(16.0%)	

Table no-2 shows the prevalence of thyroid dysfunction in patients and control population. Among the cases 64% and among the controls 84% were euthyroid. 26% of the cases and 16% of the controls were found to be having thyroid dysfunction. This difference in the prevalence of thyroid disorder is statistically significant.

Table No-3 Prevalence Of Thyroid Dysfunction In Patients With Depressive Episode And Control Population

	PATIENTS WITH DEPRESSIVE EPISODE	CONTROL POPULATION	STATISTICAL ANALYSIS
Normal Thyroid	7(43.8%)	42(84.0%)	$\chi^2=35.0 ; p<0.05$
Abnormal Thyroid	9(56.25%)	8(16.0%)	

Table no-3 shows the comparative prevalence of thyroid dysfunction in patients with depressive episode and in the control population. In our study it is found that 56.25% of depressive patients have thyroid dysfunction where as only 16.0% of the general population have it. This difference in the prevalence of thyroid disorder is statistically significant.

Table No-4 Type Of Thyroid Dysfunction In Patients With Depressive Episode And Control Population

	PATIENTS WITH DEPRESSIVE EPISODE	CONTROL POPULATION	STATISTICAL ANALYSIS
Hyperthyroid	3(18.8%)	5(5.0%)	$\chi^2=16.55; p<0.05$
Hypothyroid	6(37.5%)	3(6.0%)	$\chi^2=35.1 ; p<0.05$

Table no-4 shows the type of thyroid dysfunction in the depressive patients. 18.8% have hyperthyroidism and 37.5% have hypothyroidism among the patients with depression and in the controls it is found that 5.0% have hyperthyroidism and 6.0% have hypothyroidism. On comparison this difference between the two populations is statistically significant.

Table No-5 Prevalence Of Thyroid Dysfunction In Patients With Anxiety Disorders And Control Population

	PATIENTS WITH ANXIETY DISORDER	CONTROL POPULATION	STATISTICAL ANALYSIS
Normal Thyroid	15(79.0%)	42(84.0%)	$\chi^2=2.64$; $p=0.104$
Abnormal Thyroid	4(26.6%)	8(16.0%)	

Table no-5 shows that among the anxiety patients 26.9% have thyroid dysfunction and only 16% of the controls have abnormality in thyroid function. Additionally, when type of thyroid dysfunction is compared between the two populations it is found that there is a statistically significant difference in the prevalence of hyperthyroidism ($p<0.05$) whereas the difference in the prevalence of hypothyroidism is not statistically significant.

Table No-6 Prevalence Of Thyroid Dysfunction In Patients With Schizophrenia And Control Population

	CASES OF SCHIZOPHRENIA	CONTROL POPULATION	STATISTICAL ANALYSIS
Normal Thyroid	5(71.4%)	42(84.0%)	$\chi^2=4.58$; $P=0.104$
Abnormal Thyroid	2(28.6%)	8(16.0%)	

As shown in table no-6 the prevalence of thyroid dysfunction in patients with schizophrenia and control population are 28.6% and 16% respectively. Both the patients of schizophrenia who were found to be having thyroid abnormality are hyperthyroid. This when compared with the control population (5%) has a statistically significant difference. None of them among a total of seven schizophrenics had hypothyroidism in our study sample

DISCUSSION

Thyroid hormones play a crucial role in CNS development.¹¹ Hauser *et al.*¹² reported that an inordinately high percentage of patients with attention-deficit hyperactivity disorder exhibit thyroid hormone receptor resistance.

McLarty *et al.*¹³ found thyroid disease to be no commoner among mental hospital inmates than in the general population, while Nicholson *et al.*¹⁴ reported a figure of 8 per cent in newly admitted female psychiatric patients. Moreover, there are conflicting reports about the psychiatric symptoms characteristic of thyroid disease, for example impaired consciousness,¹⁵ mild depression and a combination of paranoid and depressive features.¹⁶

Koranyi, in a study of 2090 lower socioeconomic class out patients, showed that 43% suffered from major medical illnesses, and that 46% of these illnesses were undiagnosed by the referral source.¹⁷ Hall *et al.* studied hundred patients of lower socio economic class and found that 46% had medical illnesses that directly caused or greatly exacerbated their symptoms, while an additional 34% of patients were found to be suffering from a medical illness requiring treatment.¹⁸ Honig *et al.* examined a sample of 218 chronic psychiatric patients from an urban community psychiatric unit and reported that 53% of them had one or more probable or certain physical disease warranting further medical attention.¹⁹

Bagadia *et al.* reported that 57% of non acutely ill patients attending a general hospital outpatient department scored high on the general health questionnaire indicating a likely hood of psychiatric morbidity.²⁰ In other study Bagadia *et al.* reported that in a sample of 258 patients attending a general medical OPD, 36% of the cases had an overall psychiatric morbidity consisting of 24% pure psychiatric illness and 12% with associated organic problems.²¹

Study showed 18.8% have hyperthyroidism and 37.5% have hypothyroidism among the patients with depression and in the controls it is found that 5.0% have hyperthyroidism and 6.0% have hypothyroidism. On comparison this difference between the two

populations is statistically significant. Our finding is comparable with the several other studies which suggest an association between hypothyroidism and depression.²²

An association between overt hyperthyroidism and depression have also been widely reported which leads to poorly perceived quality of life and health status in these individuals.²³ The clinical picture in sub clinically hypothyroid patients characterized by lethargy and lack of energy simulates depression and on the other hand hypothalamic-pituitary-thyroid axis abnormalities are seen in depressed and bipolar patients.²⁴

Jefferson and Marshall identified hyperthyroidism, hypoglycemia, pheochromocytoma and hyperadrenalism as the medical illnesses most often associated with anxiety symptoms and most frequently misdiagnosed initially as a primary anxiety disorder.²⁵ Anxiety, irritability and restlessness are the well known manifestations of hyperthyroidism which has been reported in several previous studies conducted by Whybrow PC *et al.* and Joffe RT *et al.*²⁶

Patients with elevated thyroid hormonal levels frequently have psychological symptoms and sometimes have well-defined psychotic syndromes. Severe thyroid dysfunction may mimic almost any psychiatric symptom profile including psychosis.²⁷ Case reports by Ortega B *et al.* and Gruber E *et al.* refer to certain manifestations, i.e., thyrotoxic psychosis, organic schizophreniform disorder in autoimmune thyroiditis, and psychosis following acute alteration of thyroid status which is in accordance with the present study.²⁸

Evaluations of thyroid function in alcohol dependent patients have found a prevalence of 50% with abnormal thyroid levels where as it is only 16% in the control population and this difference is statistically significant. Our finding is similar to previous studies which have shown the reduction in peripheral thyroid hormones and/or blunted thyroid stimulating hormone (TSH) response to thyrotrophin-releasing hormone (TRH) in alcoholism.²⁹

CONCLUSION

The following conclusions may be derived on the basis of the observations of the present study as summarized in the previous section.

1. In the current study we found that there is statistically significant difference in thyroid levels in psychiatric patients and control population.
2. In depression there is a statistically significant difference regarding the presence of thyroid dysfunction, hyper and hypothyroidism when compared with the control population.
3. Hyperthyroidism is significantly present in the patients of anxiety and schizophrenia, whereas hypothyroidism is present in depression, alcohol dependence syndrome and in sexual dysfunction.
4. Since patients with both primary psychiatric disorders and primary thyroid disorders display similar neuro psychiatry symptoms and have involvement of central thyroid metabolism and their psycho pathology may be due to diverse primary etiologies, regulatory intervention is required both at the endocrine system level by specific chemical agents, and at the mental level.

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