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Original Research Article

Assessment of Thyroid Disorders among Patients Diagnosed with Major Depressive Disorder and Generalized Anxiety Disorder in a Tertiary Hospital in Maiduguri, Nigeria

Hadiru GM[1]*, Aisha SK[2], Atiku GM[3], Dungus MM[4], Suleiman Awwal Muhammed[1], Fatima M.L[1], Gademi FM[1], Musa A.H[3], Sani Adamu[4], Musa Abba Wakil[5], Mshelia D.S[6]

[1]Department of Chemical Pathology, University of Maiduguri Teaching Hospital, Maiduguri, Borno State
[2]Department of Haematology and Blood Transfusion, Federal University of Health Sciences, Azare, Bauchi State
[3]Department of Medical Laboratory Sciences, Faculty of Allied Health Sciences, University of Maiduguri, Borno State
[4]Department of Chemical Pathology, Faculty of Basic Clinical Sciences, Gombe State University, Gombe State, Nigeria
[5]Department of Psychiatric, Faculty of Clinical Sciences, University of Maiduguri, Borno State, Nigeria
[6]Department of Chemical Pathology, Faculty of Basic Clinical Sciences, University of Maiduguri, Borno State, Nigeria

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Abstract: ***Background*:** Thyroid dysfunction is closely associated with psychiatric disorders, particularly Major Depressive Disorder (MDD) and Generalized Anxiety Disorder (GAD). Alterations in thyroid hormones may mimic or exacerbate psychiatric symptoms, leading to diagnostic and therapeutic challenges. This study assessed thyroid disorders among patients diagnosed with MDD and GAD attending a tertiary hospital in Maiduguri, Nigeria. ***Methods*:** A comparative cross-sectional study was conducted among 300 participants comprising 100 patients with MDD, 100 patients with GAD, and 100 healthy controls. Sociodemographic data, psychiatric diagnoses based on DSM-5 criteria, and thyroid function tests (TSH, FT3, FT4) were obtained. Thyroid dysfunction was categorized into hypothyroidism, hyperthyroidism, subclinical hypothyroidism, and euthyroidism. Data were analyzed using SPSS version 26. Chi-square, ANOVA, and logistic regression were applied. Statistical significance was set at $p < 0.05$. ***Results*:** The prevalence of thyroid dysfunction was significantly higher among MDD patients (38%) and GAD patients (29%) compared with healthy controls (10%) ($p < 0.001$). Subclinical hypothyroidism was the most common abnormality among MDD patients (20%), while hyperthyroidism predominated among GAD patients (12%). Mean serum TSH was significantly elevated among MDD participants compared with controls (4.92 ± 2.11 vs 2.31 ± 1.08 mIU/L; $p < 0.001$). Logistic regression showed that female sex, age >40 years, and severity of psychiatric symptoms independently predicted thyroid dysfunction. ***Conclusion*:** Thyroid dysfunction is significantly associated with MDD and GAD among patients attending a tertiary hospital in Maiduguri. Routine thyroid screening should be incorporated into psychiatric evaluation to improve diagnosis and treatment outcomes.

Keywords: Major Depressive Disorder, Generalized Anxiety Disorder, Thyroid Dysfunction, Hypothyroidism, Hyperthyroidism, Maiduguri, Nigeria.

INTRODUCTION

Thyroid hormones play a critical role in cerebral metabolism, neurotransmitter regulation, and emotional stability [1]. Dysfunction of the hypothalamic-pituitary-thyroid axis has been implicated in several psychiatric disorders including depression and anxiety [2]. Patients with hypothyroidism commonly present with depressive symptoms, fatigue, psychomotor retardation, and cognitive impairment, whereas hyperthyroidism is often associated with anxiety, irritability, emotional lability, and insomnia [3].

Globally, the prevalence of thyroid disorders among psychiatric patients ranges from 15% to 40% [4]. Several studies have demonstrated a significant association between abnormal thyroid function and mood disorders [5, 6]. In low- and middle-income countries including Nigeria, psychiatric illnesses remain

***Corresponding Author:** Hadiru GM
Department of Chemical Pathology, University of Maiduguri Teaching Hospital, Maiduguri, Borno State

underdiagnosed and frequently coexist with endocrine disorders [7].

Major Depressive Disorder (MDD) is among the leading causes of disability worldwide, affecting more than 280 million individuals [8]. Generalized Anxiety Disorder (GAD) is also highly prevalent and characterized by persistent excessive worry and autonomic hyperactivity [9]. Evidence suggests that thyroid dysfunction may worsen psychiatric symptoms and reduce response to psychotropic medications [10].

Despite increasing evidence globally, few studies have explored the burden of thyroid dysfunction among psychiatric patients in Northeastern Nigeria, particularly in Maiduguri where psychological stress associated with insurgency and socioeconomic instability may contribute to psychiatric morbidity [11].

This study therefore aimed to assess thyroid disorders among patients diagnosed with MDD and GAD in a tertiary hospital in Maiduguri, Nigeria.

Materials and Methods

Study Area

The study was conducted at the Department of Psychiatry, University of Maiduguri Teaching Hospital (UMTH), Maiduguri, Borno State, Nigeria.

Study Design: A hospital-based comparative cross-sectional study.

Study Population

Three groups were recruited:

- 100 patients diagnosed with MDD
- 100 patients diagnosed with GAD
- 100 healthy adults (controls)

Total sample size = 300 participants.

Inclusion Criteria

- Adults aged 18–65 years
- Diagnosed cases of MDD or GAD using DSM-5 criteria
- Apparently healthy controls without psychiatric illness

Exclusion Criteria

- Pregnancy
- Chronic kidney disease
- Diabetes mellitus
- Current thyroid medications
- Substance abuse

Laboratory Analysis

Blood samples were collected for:

- Thyroid Stimulating Hormone (TSH)
- Free Triiodothyronine (FT3)
- Free Thyroxine (FT4)

Reference Ranges:

- TSH: 0.4–4.5 mIU/L
- FT4: 0.8–2.0 ng/dL
- FT3: 2.3–4.2 pg/mL

Statistical Analysis

Data were analyzed using SPSS version 26. Means were compared using ANOVA while categorical variables were analyzed using Chi-square tests. Logistic regression identified predictors of thyroid dysfunction.

Results

Table 1: Sociodemographic Characteristics of Participants

Variable	MDD (n=100)	GAD (n=100)	Controls (n=100)	p-value
Mean Age (years)	38.6 ± 11.4	35.9 ± 10.8	36.2 ± 9.7	0.221
Female (%)	64%	61%	55%	0.310
Married (%)	58%	52%	60%	0.520
Unemployed (%)	44%	39%	20%	<0.001

Table 2: Thyroid Function Parameters among Study Groups

Parameter	MDD	GAD	Controls	p-value
TSH (mIU/L)	4.92 ± 2.11	3.88 ± 1.74	2.31 ± 1.08	<0.001
FT3 (pg/mL)	2.71 ± 0.82	3.62 ± 0.91	3.31 ± 0.63	<0.001
FT4 (ng/dL)	1.01 ± 0.32	1.44 ± 0.41	1.29 ± 0.28	<0.001

Table 3: Distribution of Thyroid Disorders among Participants

Thyroid Status	MDD (%)	GAD (%)	Controls (%)
Euthyroid	62	71	90
Subclinical Hypothyroidism	20	10	5
Overt Hypothyroidism	10	4	2
Hyperthyroidism	6	12	2
Subclinical Hyperthyroidism	2	3	1

Chi-square = 31.6, $p < 0.001$

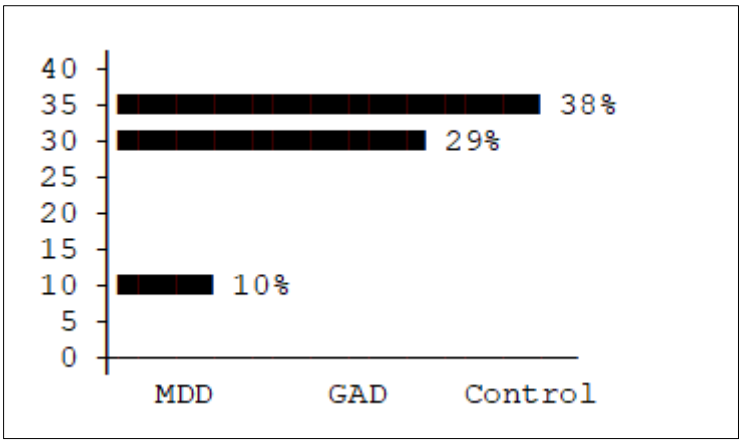

Figure 1: Prevalence of Thyroid Dysfunction

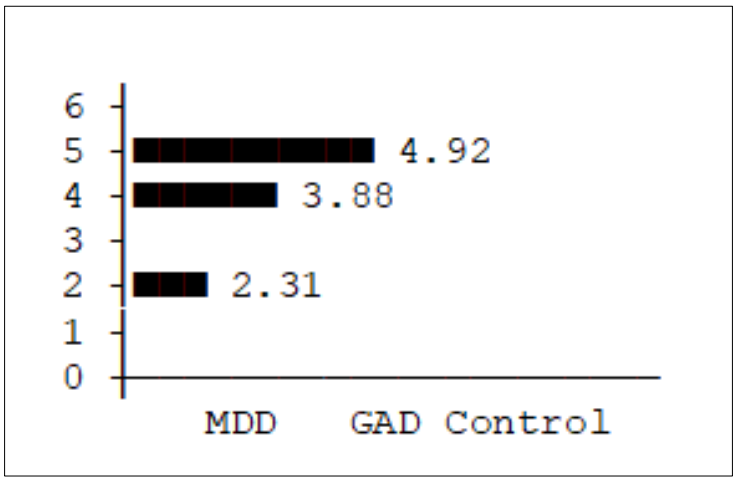

Figure 2: Mean Serum TSH Levels

Table 4: Logistic Regression Predicting Thyroid Dysfunction

Variable	Adjusted OR	95% CI	p-value
Female Sex	2.11	1.23–3.64	0.004
Age >40 years	1.94	1.10–3.41	0.020
Severe Depression	2.87	1.51–5.42	0.001
Severe Anxiety	2.14	1.20–4.12	0.011

DISCUSSION

This study demonstrated a significantly higher prevalence of thyroid dysfunction among patients with MDD and GAD compared with healthy controls. The prevalence among MDD patients (38%) aligns with previous studies indicating a strong association between depressive disorders and hypothyroidism [12, 13].

Elevated serum TSH levels observed among MDD participants suggest impaired thyroid function and support findings from prior research linking hypothyroidism with depressive symptomatology [14]. Thyroid hormones influence serotonergic and noradrenergic neurotransmission, mechanisms implicated in depression [15].

Among GAD patients, hyperthyroidism and subclinical hyperthyroidism were more common. Hyperthyroidism increases adrenergic activity, resulting in symptoms such as palpitations, nervousness, tremors, and anxiety [16]. Similar findings have been reported in studies from India and Europe [17, 18].

Female participants had higher odds of thyroid dysfunction, consistent with epidemiological evidence showing increased thyroid disease among women [19]. Age above 40 years was also associated with abnormal thyroid function, supporting previous findings [20].

Routine thyroid screening among psychiatric patients may improve early diagnosis and treatment outcomes. Failure to recognize thyroid dysfunction may lead to poor response to antidepressants or anxiolytics [21].

CONCLUSION

Thyroid dysfunction is significantly prevalent among patients diagnosed with MDD and GAD in Maiduguri, Nigeria. Subclinical hypothyroidism was more common among MDD patients, while hyperthyroidism predominated among GAD patients. Integrating thyroid function testing into psychiatric evaluation may improve patient care and therapeutic outcomes.

RECOMMENDATIONS

1. Routine thyroid function tests should be included in psychiatric assessments.
2. Collaborative care between psychiatrists and endocrinologists is recommended.
3. Larger multicenter longitudinal studies should be conducted in Nigeria.
4. Public health awareness on the relationship between thyroid disorders and mental health should be strengthened.

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