

# **Thyroid and Adrenal Axis in Some Depressive Disorders**

*Thesis*

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ  
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## **List of abbreviation**

ACTH	Adreno-cortico-trophin hormone
AD	Alzheimer's disease
ADMD	Attention-deficit hyperactivity disorder
ANP	Atrial naturitic peptide
AR	Androgen receptor
BDI	Beck depression Inventory
CES-D	Center for epidemiologic studies depression scale
CRH	Corticotropin releasing hormone
CRS	Carrol rating scale
DCX	Doublecortin immunopositive cells
DHEA	Dehydroepiandrosterone
DIS	Diagnostic Interview schedule
DSM-IV	Diagnostic and statistical manual of mental disorders – fourth edition
DST	Dexamethasone suppression test
ECT	Electroconvulsive therapy
EEG	Electroencephalographic
FT <sub>3</sub>	Free triiodothyronine
FT <sub>4</sub>	Free thyroxine
GH	Growth hormone
GR	Glucocorticoid receptors
HO	Overt hypothyroidism
HPA	Hypothalamic pituitary Adrenal axis
HPGH	Hypothalamic-pituitary-growth hormone axis
HPGn	Hypothalamic-pituitary-gonadal axis
HPT	Hypothalamic pituitary Thyroid axis
HRSD	Hamilton rating scale for depression
ICD	International classifications of diseases
IFN	Interferon
LH	Leutinizing hormone
MAOIs	Monoamine oxidase inhibitors
MDD	Major depressive disorder
MMAS	Massachusetts Male aging study

mPFC	Medical prefrontal cortex
MR	Mineralocorticoid receptors
NASSAs	Noradrenergic and specific serotonergic antidepressants
NE	Norepinephrine
NRIs	Norepinephrine (noradrenaline) reuptake inhibitors
PD	postpartum depression
PFC	Prefrontal cortex
pHPT	Primary hypothyroidism
PHQ	Patient health questionnaire
PPT	Postpartum thyroiditis
PPTD	postpartum thyroid dysfunction
PTSD	Post traumatic stress syndrome
PVN	Paraventricular nucleus
REM	Rapid eye movement
RHA	Roman high avoidance
RIMA	Reversible inhibitor of monoamine oxidase
RLA	Roman low avoidance
rTMS	Repetitive transcranial magnetic stimulation
SAD	Seasonal affective disorders
SAM-e	S-adenosyl methionine
SCH	Subclinical hypothyroidism
SCN	Suprachiasmatic nucleus
SNRIs	Serotonin-norepinephrine reuptake inhibitors
SNS	Sympathetic nervous system
SON	Supraoptic nucleus
SSAD	Subsyndromal seasonal affective disorders
SSRI	Selective serotonin reuptake inhibitors
T <sub>3</sub>	triiodothyronine
T <sub>4</sub>	thyroxine
TCAs	Tricyclic antidepressants
TH	Thyroid hormone
TPO	Thyroid peroxidase
TRD	Treatment resistant depression
TRH	Thyrotropin releasing hormone
TRs	Thyroid hormone receptor
TSH	Thyroid stimulating hormone

## **Introduction & Aim of the Study**

## **Introduction & Aim of the Study**

Depression is one of the most common psychiatric disorders. For a long time, clinicians suspected a causal link between depression and the endocrine system. (*Tichomirowa et al., 2005*).

Recent data suggest that depression may constitute a risk factor for development of dementia, especially in atypical patients who have high rates of Hypothalamo-Pituitary-Adrenal axis disorders. (*Fountoulakis et al., 2005*).

Some psychiatric symptoms in depression could be related to masked thyroid dysfunction and there is frequent association of thyroid function with mood disorders. Therefore, routine thyroid function assessment in patients with mood disorders and the treatment of subclinical thyroid dysfunction is recommended. (*Danilo et al., 2004*). Evidence supports that hyperactivity of the Hypothalamic-Pituitary-Adrenal axis has a pivotal role in the psychobiology of severe depression. (*Duval et al., 2006*).

Major depressive disorder has been associated with changes in Hypothalamus-Pituitary-Thyroid (HPT) axis and with an activation of the Hypothalamus-Pituitary-Adrenal (HPA) axis. (*Brouwer et al., 2005*).

### ***Aim of the study***

The aim of this study is to compare changes in Hypothalamus-Pituitary-Thyroid (HPT) axis and Hypothalamus-Pituitary-Adrenal (HPA) axis in different depressive disorders.

### ***Patients and methods***

The study will be conducted on 50 cases between (20 – 60 year), psychiatric patients suffering from depressive disorders. They will be diagnosed according to the international classification of diseases (ICD-10) criteria of diagnosis by symptom check list, all will be chosen from the psychiatry outpatient clinic in Ain Shams University hospitals.

### **Exclusion criteria:-**

1. Other medical and endocrinal disorders.
2. Comorbid psychiatric disorders.

**The patients will be divided into 2 groups:-**

- Group 1:
  - a. 10 patients with unipolar depression.
  - b. 10 patients with bipolar depression.
  - c. 10 patients with mixed anxiety depression.
- Group 2:
  - 20 normal control cases.

**All patients will be subjected to:-**

1. Full medical history and through clinical examination.
2. Full psychiatric history.
3. All cases will be subjected to estimation of :
  - a. Serum TSH level by enzyme immunoassay (ELISA).
  - b. Free T3 level by enzyme immunoassay (ELISA).
  - c. Free T4 level by enzyme immunoassay (ELISA).
  - d. Serum cortisol by enzyme immunoassay (ELISA).
  - e. Low dose dexamethasone suppression test by giving the patient 0.5 mg dexamethasone 6 hourly for 48 hour then 9 a.m. estimation of serum cortisol during second day by enzyme immunoassay (ELISA).
  - f. Other investigations to exclude any possible chronic diseases:
    1. Complete blood count.
    2. Fasting blood glucose and Hb A1C.
    3. Liver function tests.
    4. Kidney function tests.
    5. ESR.

***Data Analysis:-***

The results of this study will be tabulated and statistically analysed using the standard statistical methods

# **Review of Literature**

## Clinical Depression

### *Introduction*

**Clinical depression** (also called **major depressive disorder**, or **unipolar depression** when compared to bipolar disorder) is a state of intense sadness, melancholia or despair that has advanced to the point of being disruptive to an individual's social functioning and/or activities of daily living.

Although a low mood or state of dejection that does not affect functioning is often colloquially referred to as depression, clinical depression is a clinical diagnosis and may be different from the everyday meaning of "being depressed." Many people identify the feeling of being clinically depressed as "feeling sad for no reason", or "having no motivation to do anything." A person suffering from depression may feel tired, sad, irritable, lazy, unmotivated, and apathetic. Clinical depression is generally acknowledged to be more serious than normal depressed feelings. It often leads to constant negative thinking and sometimes substance abuse. Extreme depression can culminate in its sufferers attempting or committing suicide.

Without careful assessment, delirium can easily be confused with depression and a number of other psychiatric disorders because many of the signs and symptoms are conditions present in depression, as well as other mental illnesses including dementia and psychosis. (*Gleason, 2002*)

### *Types of depression*

Depressive disorders come in different forms, just as is the case with other illnesses such as heart disease. This pamphlet briefly describes three of the most common types of depressive disorders. However, within these types there are variations in the number of symptoms, their severity, and persistence.

**Major depression** is manifested by a combination of symptoms (see symptom list) that interfere with the ability to work, study, sleep, eat, and enjoy once pleasurable activities. Such a disabling episode of depression may occur only once but more commonly occurs several times in a lifetime.