Lipid Profile and Impulsivity in Suicidal Patients with Major Depression

Thesis

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Sara Abdallah Atia Helal

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Contents

List of Abbreviations

5-HIAA.....5-hydroxyindoleacetic acid

5-HT.....Serotonin

5-HTT.....Serotonin transporter

AMPA.....α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid

AN .....Anorexia nervosa

APA.....American Psychiatric Association

ApoE.....Apolipoprotein E

ASPD .....Antisocial personality disorder

AUD.....Alcohol use disorder

BAD .....Bipolar affective disorder

BDNF.....Brain-derived neurotrophic factor

BIS .....Barratt impulsiveness scale

BPD.....Borderline personality disorder

BSIS .....Beck's Suicidal intent scale

CDC.....Centers for Disease Control and Prevention

COMT.....Catecholamine-O-methyltransferase

CRP.....C-reactive protein

CSF .....Cerebrospinal fluid

DA.....Dopamine

DSM-IV`.....Diagnostic and Statistical Manual of Mental Disorders, 4th Edition

FDA.....Food and Drug Administration

FH .....Family history

GABA.....Gamma amino butyric acid

Glu .....Glutamate

HDL.....High-density lipoprotein

HPA ..... Hypothalamo-adrenal axis

HVA..... Homovanillic acid

IL-10 ..... Interleukin ten

IL-13 ..... Interleukin thirteen

IL-1$_\beta$..... Interleukin one beta

IL-2 ..... Interleukin two

IL-4 ..... Interleukin four

IL-6 ..... Interleukin six

IL-8 ..... Interleukin eight

INF-α..... Interferon-α

INF-γ..... Interferon-γ

KYN..... Kynurenine

LDAEP ..... Loudness-dependence of auditory evoked potentials

LDL..... Low-density lipoprotein

MAO-A..... Monoamine Oxidase A

MDD ..... Major depressive disorder

MHPG 3-methoxy-4-hydroxyphenylglycol

N..... Number

NE ..... Norepinephrine

NMDA .....N-methyl-D-aspartate

OCD ..... Obsessive-compulsive disorder

OPC ..... Outpatient clinic

PDs..... Personality disorders

PFC.....prefrontal cortex

PH ..... Past history

PIC..... Picolinic acid

PTSD..... Post traumatic stress disorder

PUFAs.....Polyunsaturated fatty acids

QUIN .....Quinolinic acid

SCID I .....Structured Clinical Interview for DSM-IV Axis I Disorders

SCID II .....Structured Clinical Interview for DSM-IV Axis II Disorders

SD.....Standard Deviation

SPS.....Suicide probability scale

SPSS.....Statistical package for Social Science

SSRIs .....Selective serotonin reuptake inhibitors

SUD.....Substance use disorder

TC .....Total Cholesterol

TG.....Triglycerides.

TGF-β.....Transforming growth factor-β

TH.....Tyrosine hydroxylase

TNF-α.....Tumor necrosis factor-α

TPH.....Tryptophan hydroxylase

TrkB .....Tropomyosin-receptor kinase B

TRP.....Tryptophan

USA .....United States of America

VEGF.....Vascular endothelial growth factor

VLDL.....Very-low-density lipoprotein

WHO.....World Health Organization

List of Table

List of Figures

Abstract

Background: The mechanism underlying the link between lipid profile and suicidality is not yet understood, and is still controversial. Additionally, the relation between lipid profile and impulsivity was not studied in depressed suicidal patients.

Since Cholesterol is a core component of the central nervous system (CNS), essential for the cell membrane stability and the correct functioning of neurotransmission, there might be a correlation between altered lipid profile, suicidal tendencies, and impulsivity in depression.

Objectives: To compare between lipid profile in suicidal and non-suicidal depressed patients and to find out if there is any correlation between impulsivity and lipid profile in depressed patients attempting suicide.

Methodology: This is a cross sectional comparative (case - control) study. The sample was selected from the Institute of Psychiatry, Faculty of Medicine, Ain Shams University Hospital and Al-Mashfa Hospital, from inpatients and outpatients diagnosed with unipolar depression. A sample of 100 patients distributed as 50 cases and 50 controls meeting the inclusion and exclusion criteria.

Results: TC was found significantly lower in suicidal group compared to non-suicidal depressed group. Low HDL level was significantly correlated with suicidality and high suicide intent was correlated with hopelessness. Logistic regression for lipid profile in both groups revealed significant TC and LDL in pr3diction of suicide.

Conclusion: The results of the present study demonstrated a statistical significance regarding TC and LDL in relation to suicidality, which could be a potential marker to detect possibility of suicide in depressed patients.

Recommendations: Further in-depth qualitative research is needed to help in understanding the many vague areas of suicide, its predictors and behaviors associated with it among Egyptian patients. Repeat the study on large sample to compare and give more generalized results and valuable outcomes.

Keywords: Suicide - Major Depressive Disorder – Lipid Profile - Impulsivity

INTRODUCTION

Suicide is a multifaceted public health problem, yearly causing a world-wide premature loss of about one million lives, and generating a cascade of consequences affecting families, friends and societies that are often irrecoverable ***(Lee and Kim, 2011).*** Regarded as the most dreaded of psychiatric disease outcomes, a diversity of risk factors for suicide have been recognized, of which depression stands prominent ***(Gibbs, 2016).*** WHO estimates that more than 300 million people now live with depression, which is more than 18% increase between 2005 and 2015 ***(Wang et al, 2016).***

Impulsivity also contributes to suicidality, and therefore might be an important construct for further investigation ***(Troisi, 2011).***

Studies have proposed biological markers that might be linked to suicidal behaviour and therefore might be used as a tool in detection, prevention and approaches of therapy ***(Lee and Kim, 2011).*** However, clear evidences on suicide neurobiology are presently lacking ***(Wang et al., 2016).***

Clinically, serum lipids are evaluated based on the level of total cholesterol (TC), high-density lipoprotein cholesterol (HDL), low-density lipoprotein cholesterol (LDL) and triglycerides (TG). Evidence indicated that lipid fluidity evidently modulates serotonin (5-HT) binding in mice brain membranes; thus, decreased cholesterol levels

cause cellular membrane fluidity to increase, rendering 5-HT receptors less exposed to 5-HT in the synaptic cleft. Furthermore, evidence correlates reduced 5-HT activity and suicide ***(Diaz-Sastreet et al., 2007).***

It has been proposed that poor central serotonergic transmission is a biological substrate for impulsivity; and similarly, serum cholesterol has been suggested as a surrogate marker (***Vevera et al., 2005)***, moreover, a correlation between serum cholesterol and various measures of impulsivity across psychiatric diagnoses has been demonstrated (***Troisi, 2011).***

Nonetheless, clear association between serum lipid levels and reported suicidality in observational and epidemiological studies remains controversial. Whereas some human studies disclosed that individuals attempting suicide had lower cholesterol levels, ***(Diaz-Sastreet et al., 2007)*** others reported positive association linking cholesterol and completed suicide. ***(De Leon et al., 2011).***

A meta-analysis proposed that suicidal patients had significantly lower serum TC, LDL-C and TG levels compared with non-suicidal patients. In comparison with healthy controls, suicidal patients had significantly lower TC, HDL-C and LDL-C levels. Moreover, compared with the highest serum TC level category, a lower serum TC level was linked to a greater risk of suicidality, counting the risk of attempted suicide and completed suicide ***(Wu, et al,***

2016). On the other hand, a number of studies showed no evidence for any association between serum cholesterol levels and suicidal behaviour ***(Roy, et al., 2006)***.