

**Metabolic syndrome among; drug naive
1st episode psychotic patients –
a preliminary study**

**Thesis submitted in partial fulfillment of master degree in
neuropsychiatry**

By

Tamer Mahmoud El Sayed Roushdy

Mb, Bch

Supervised by

Professor: Safeya Mahmoud Ahmed Effat

**Professor of Neuropsychiatry
(Ain shams university)**

Professor: Afaf Mohamed Abd El Samei

**Professor of Neuropsychiatry
(Ain shams university)**

Dr: Soheir Helmy El Ghonemy

**Lecturer of Neuropsychiatry
(Ain shams university)**

Faculty of Medicine- Ain-Shams University

2010

Dedication

I wish to dedicate this work to my beloved mother and my late father, who have always loved me and made me state arguments for my opinions since my early childhood.

I would also like to express my deep gratitude to my beloved brothers and sisters in law for their support and love all through my life. Special thanks and deep appreciation to my beloved fiancé for her continuous support and encouragement.

Acknowledgements

This work was carried out at the institute of psychiatry faculty of medicine Ain Shams University.

During this study I have had the opportunity to draw upon the knowledge, expertise and experience of numerous friends and co-workers, without whom this study would not have been completed.

I wish to express my sincere gratitude to Professor Safeya Mahmoud Ahmed Effat, professor of Neuropsychiatry, Ain shams university, She has always believed in this study, even during the hard moments, and given me the support I have needed and without her enthusiastic support and

encouragement this work would have never been completed . my deepest thanks for her guidance and advice regarding every step of this research.

I am also most grateful to Professor Afaf Mohamed Abd El Samei, professor of Neuropsychiatry, Ain shams university. She has been supportive since this research was just an idea till it was completed. I really learned a lot from her supervision and my deepest appreciation for her valuable support.

I want to express my most sincere and special thanks to my Dr. Soheir Helmy El Ghonemy, lecturer of Neuropsychiatry, Ain shams university, her excellent knowledge of

scientific work and her rational advice have been an essential part of carrying out this study.

I also acknowledge my deep indebtedness and gratefulness for my friends and colleagues who helped me all through this work. My deep appreciation goes to both patients and volunteers who shared in this work without their patients I wouldn't be able to accomplish this work.

Index

Abstract	vi
List of abbreviations	viii
List of tables	xi
List of figures	xiii
Introduction	1
Chapter I: Impact of metabolic syndrome on medical / physical disease in mentally ill patients.	10
Chapter II: Metabolic syndrome and psychiatry Interrelationship.	31
Chapter III: Diagnosing and treating metabolic syndrome different components as well as its medical/physical complications.	55
Subjects and Methods.	84
Results:	95
(section 1): Descriptive Statistics, Demographic data of the sample.	95
(section 2): Clinical profile of the cases as well as different components of metabolic syndrome in the study groups	100
(section 3): Metabolic syndrome variables in different types of psychosis	121

Discussion	135
Limitation of the study	152
Conclusion and recommendations	153
Summary	155
References	160
الملخص العربي	

Abstract

Objective: the aim of this study was to examine the rate of metabolic syndrome among drug naïve 1st episode psychotic patients admitted to institute of psychiatry Ain shams university hospitals, in a 6 month interval compared to control matched for age, sex and social class as well as determining which item of the metabolic syndrome is more important for the diagnosis.

Method: total of 20 cases and 20 controls were included in the study, the diagnosis of cases was based on ICD10 as well as semi structure clinical interview for diagnosis used by the institute of psychiatry, each was subjected to waist circumference, body mass index, oral glucose tolerance test, high density lipoprotein cholesterol, triglycerides and blood pressure measurements and the results were compared to the standard IDF definition criteria for metabolic syndrome.

Results: rate of metabolic syndrome in cases was 65% compared to 35% in controls based on IDF criteria; with P-value of 0.056, those components which were statistically

significant were waist circumference, BMI and OGTT with P-values of 0.012, 0.022 and 0.043 respectively.

Discussion: the current study showed that impaired OGTT, increased waist circumference and obesity (BMI > 30 kg/m²) were frequent as well as statistically significant among cases compared to controls while other components of metabolic syndrome although frequent in cases yet were statistically insignificant, denoting that MS or its components is to develop even before administering antipsychotic medication in severe mentally ill patients out of condition within such illnesses, and so there has to be a well defined programs for screening and managing MS in such population of patients.

List of abbreviations

AACE	American association of clinical Endocrinology
ACE	Angiotensin converting enzyme
ADA	American diabetes association
AL	Allostatic model
ATPIII	Adult treatment panel III
B-cell	Pancreatic beta cells
BAD	Bipolar affective disorder
Bl/Pr	Blood pressure
BMI	Body mass index
BP	Blood pressure
CATIE	Clinical antipsychotic trial of international effectiveness
CGI	Clinical global impression
CHD	Coronary heart disease
Cm	Centimeter
CNS	Central nervous system
CRP	C-reactive protein
CT	Computed topography
CVD	Cardiovascular disease
DM	Diabetes mellitus
DSMIV	Diagnostic and statistical manual of mental disorders IV
EASD	European association for the study of diabetes
ECG	Electrocardiogram
EGIR	European group for the study of insulin resistance
FBG	Fasting blood glucose

List of Abbreviations

FPG	Fasting plasma glucose
GC	Glucocorticoids
GTT	Glucose tolerance test
HbA1c	Glycated hemoglobin
HDL-C	high density lipoprotein cholesterol
HOMA	Homeostatic model assessment
HPA axis	Hypothalamic pituitary adrenal axis
IAF	Intra-abdominal fat
ICD	International classification of diseases
IDF	International diabetes federation
IFG	Impaired fasting glucose
IGT	Impaired glucose tolerance
IL	Interleukin
IR	Insulin resistance
JNC	Joint national committee
LDL-C	Low density lipoprotein cholesterol
MRI	Magnetic resonance imaging
MS	Metabolic syndrome
NIMH	National institute of medical health
OGTT	Oral glucose tolerance test
RR	Relative risk
SD	Standard deviation
SMI	Severe mental illness
SMR	Standardized mortality rate
SUF	Subcutaneous fat
TG	Triglycerides

List of Abbreviations

TNF- α	Tumor necrosis factor alpha
US	United states
VA-HIT	Veterans' affairs high density lipoprotein intervention trail
VLDL	Very low density lipoprotein
WHO	World health organization
5-HT	Serotonin

List of tables

Table 1: Health complications/physical illnesses of obesity.	14
Table 2: Estimated prevalence and relative metabolic. Syndrome risk factors for cardiovascular disease risk in schizophrenia and bipolar disorder compared to the general population.	22
Table 3: Risk factors for diabetes mellitus in patients with mental illness.	30
Table 4: Relative risk of weight gain with antipsychotic drugs.	35
Table 5: Metabolic syndrome diagnosis based on IDF definition	89
Table 6: BMI values.	93
Table 7: Comparison between cases and controls as regards age.	96
Table 8: Comparison between cases and controls as regards Sex.	97
Table 9: Comparison between cases and controls as regards Educational level.	98
Table 10: Comparison between cases and controls as regards socioeconomic class.	99
Table 11: Number and percentage of diagnoses of the cases participating in the study.	100
Table 12: Waist circumference values in sample studied.	101
Table 12.1: Comparison between cases and controls regarding waist circumference.	103
Table 13: Categories of BMI in both groups.	103
Table 13.1: Values of BMI between the studied subjects	105
Table 14: Categories of glucose levels as measured by OGTT in both groups.	106
Table 15: FBG values of the studied subjects	107
Table 16: GTT values of the studied subjects	108
Table 17: Categories of high density lipoprotein cholesterol values in both groups	108
Table 18: High density lipoprotein cholesterol values between the studied subjects	110

List of tables

Table 19: Categories of Triglycerides values in both Groups	110
Table 20: Triglycerides values between the studied subjects	112
Table 21: Categories of blood pressure between cases and Control	113
Table 22: Systolic Bl/Pr values in sample studied	114
Table 23: Systolic Bl/Pr values between the studied subjects	116
Table 24: Diastolic Bl/Pr values in sample studied	116
Table 25: Diastolic Bl/Pr values between the studied subjects	118
Table 26: Metabolic syndrome values in sample studied	118
Table 27: Metabolic syndrome in correlation to sex between studied subjects	120
Table 28: Waist circumference values between control and cases' different diagnoses	122
Table 29: BMI value between control and cases' different diagnoses.	124
Table 30: Glucose value in control and cases' different diagnoses.	126
Table 31: HDL-C value between control and cases' different diagnoses.	127
Table 32: TG value between control and cases' different diagnoses.	129
Table 33: Systolic Bl/Pr value between control and cases' different diagnoses.	131
Table 34: Diastolic Bl/Pr value between control and cases' different diagnoses.	132
Table 35: MS among control and cases' different diagnoses.	134

List of figures

Figure 1: Pathogenesis of hypertension in the metabolic syndrome.	38
Figure 2: The link between the metabolic effects of glucocorticoids And the features of the metabolic syndrome.	46
Figure 3: Pathogenesis of type II diabetes mellitus.	51
Figure 4: Framingham score of absolute risk of CHD.	65
Figure 5: Relative risk of CVD.	73
Figure 6: Cardiovascular risk management in people with severe Mental illness.	76
Figure 7: Percentage of different diagnoses of the cases	101
Figure 8: Percentage of normal and predicting waist circumference between both groups	102
Figure 9: Categories of BMI between both groups	104
Figure 10: Percentage of normal, IFG, IGT and DM between both groups.	106
Figure 11: Percentage of high density lipoprotein cholesterol between both groups.	109
Figure 12: Percentage of Triglycerides between both groups.	111
Figure 13: Categories of blood pressure between cases and control.	113
Figure 14: Percentage of systolic Bl/Pr between both groups.	115
Figure 15: Percentage of diastolic Bl/Pr between both groups.	117
Figure 16: Percentage of metabolic syndrome between both groups.	119
Figure 17: Metabolic syndrome in correlation to sex between studied subjects.	120
Figure 18: Waist circumference values between control and cases' different diagnoses.	122
Figure 19: BMI values between control and cases' different diagnoses.	124
Figure 20: Glucose values in control and cases' different diagnoses.	126