Original Article

Systemic Profile in Psychiatric Patients

Blood Glucose, Cholesterol, Body Mass Index and Systemic Blood Pressure in Psychiatric Patients Attending a Tertiary Care Hospital of Sindh

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ABSTRACT

Objective: The present observational study was conducted to determine the blood glucose, body mass index, blood pressure and serum cholesterol in psychiatric patients.

Study Design: Observational study.

Place and Duration of Study: This study was carried out at Psychiatric Clinic, Department of Medicine, Indus Medical College, Tando Muhammad Khan, Sindh from June 2014 to January 2016.

Materials and Methods: A sample of 275 new cases suffering from different Psychiatric disorders was selected. Diagnosis of Psychiatric disorders was made by a consultant Psychiatrist. Body weight, height and systemic blood pressure were measured by standard methods. Willing participants were asked to sign a proforma of consent for ethical issues. Data was entered on excel sheet and copied to the SPSS 22.0 for statistical analysis. Analysis was performed at P value of ≤ 0.05.

Results: Mean ± SD age was noted as 47± 11.97 years (p = 0.02). Male to female ratio was 1.83 vs. 1.0 (p=0.0001). BMI ≥ 30 was noted in 26.5% of subjects. Of 275 study subjects, normal blood glucose was noted in 79.6% while 20.3% of psychiatric patients showed raised blood glucose levels. Normal and raised blood cholesterol was noted in 65.09% and 34.9% respectively. Psychiatric disorders were correlated with blood glucose and blood cholesterol levels.

Conclusion: Psychiatric disorders are a risk factor for raised blood glucose, blood cholesterol, BMI and Systemic hypertension; this predisposes patients for diabetes mellitus and associated morbidities.

Key Words: Psychiatric disorders, Blood glucose, Blood cholesterol

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INTRODUCTION

Psychiatric disorder is a clinically significant behavioral or psychological syndrome that occurs in an individual. These are usually associated with distress or disability or with a significantly raised risk of death, pain, disability or an important loss of freedom. In addition, this Psychiatric disorder must not be merely an expectable and culturally sanctioned response to a particular event such as death of close loved one family member. Irrespective of whatever the cause, a Psychiatric disorder is considered a manifestation of a behavioral, psychological, or biological dysfunction in an individual[1,2].

Chronic stress of psychiatric disorders may be associated with metabolic disorders, collectively known as the metabolic syndrome. This occurs because of hormones of stress in particular the glucocorticoids which are anti insulin hormones and put the patient at risk. Metabolic syndrome is a collectively gathered risk factors for some diseases such as cardiovascular disease (CVD) and type 2 diabetes (DM). Metabolic syndrome includes any three of the five components necessary for the diagnosis: elevated waist circumference, blood pressure, serum triglyceride and blood glucose and cholesterol[3,4].

Previous studies indicated 43% and 46% prevalence of metabolic syndrome in Psychiatric disorders [5,6]. Incidentally, people with psychiatric diseases such as schizophrenia have lower life expectancy compared to those without mental illness and those with coronary artery diseases[7]. 19. 6%, 42.4%, 12.3%, and 8.5% of schizophrenia, schizoaffective psychosis, relapsing depression, and bipolar affective disorder, respectively, are reported suffering from metabolic syndrome[8, 9]. Studies on patients with severe mental stress have shown that male and female schizophrenic patients have 138% and 251% more chance of having metabolic syndrome than general populations[10]. More prevalence of metabolic syndrome in these subjects may be related to the disease itself, antipsychotic drug therapy, obesity, dietary fats, low physical activity, and active smoking[11]. Patients with

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severe mental illness die earlier than the general population[4]. In developed countries, psychiatric symptoms such as irritability, suicidal ideas, anxiety, depression, and cognitive problems have been widely reported among diabetes mellitus (DM) patients [12, 13]. In Pakistan, where a rising incidence of DM has been noted, the disease poses high socio-economic burden. DM is significantly associated with anxiety, worries and psychological problems[14].

The frequency of metabolic problems among psychiatric patients remains a neglected topic in Pakistan. The present study aimed to determine the blood glucose, body mass index, blood pressure and blood cholesterol among patients with psychiatric disorders reporting at tertiary care hospital of Indus Medical College, Tando Muhammad Khan, Sindh.

MATERIALS AND METHODS

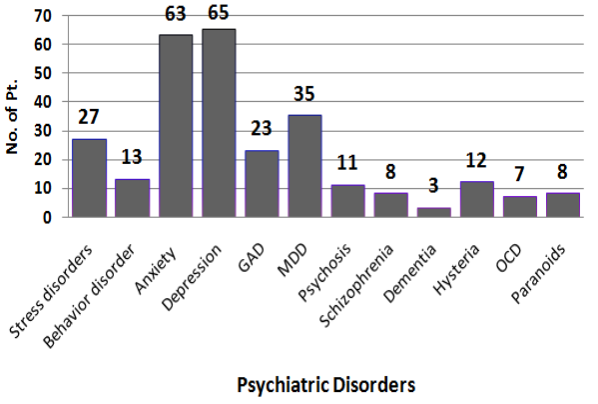
The present observational study was conducted at the Psychiatric clinic, Department of Medicine, Indus Medical College, Tando Muhammad Khan, Sindh from June 2014 to January 2016. A sample of 275 new cases of different Psychiatric disorders was selected. Age of 20 – 80 of both genders was included. Subjects suffering from major systemic disorders were excluded from study protocol. Diagnosis of Psychiatric disorder was made a consultant Psychiatrist. Body weight, height and systemic blood pressure were measured per standard criteria. Subjects were communicated for entry into study for their willingness to participate. Body mass index was calculated by kg/m^2 formula. BMI ≥ 30 kg/m^2 was taken as obesity and < 30 kg/m^2 was taken as normal. Blood pressure was defined according to JNC VIII criteria. Normal BP was defined ≤120 and 80 mmHg. Willing volunteers were informed about the advantages, disadvantages, loss and benefits of study. Volunteers were informed if they feel any problem they can withdraw from study without any information. Only willing participants were asked to sign a proforma of consent. Institutional ethical permission was taken. Ante cubital vein was selected preferably for the collection of blood samples after aseptic measures. Colorimetric assay method was employed for blood cholesterol on the Roche Chemistry analyzer. Glucose oxidase method was used for the detection of blood glucose. Blood pressure was measured by a mercury sphygmomanometer. Data was entered on excel sheet and copied to the SPSS 22.0 for statistical analysis. Student t test and Chi square test were used for the numerical and categorical variables. Analysis was performed at P value of ≤ 0.05. Microsoft excel sheet was also used for graphing.

RESULTS

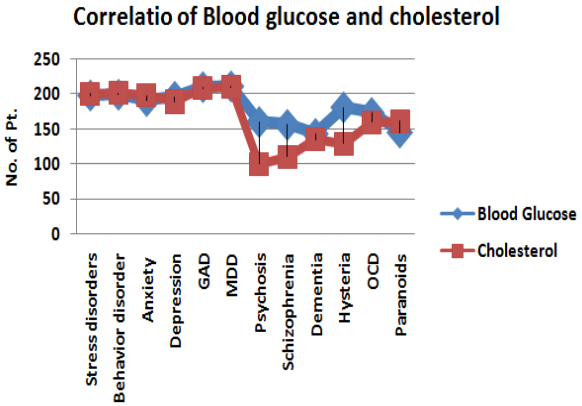
Age, BMI, Systemic blood pressure, blood glucose and cholesterol are shown in table I. Mean ± SD age was noted as 47± 11.97 years (p = 0.02). Most common age category belonged to 4th decade as shown in table 2.

Table No.I: Characteristics of study population (n=275)

	Mean	SD	t-value	p-value
Age	47	11.97	14.9	0.02
BMI (kg/m^2)	27	7.8	13.2	0.04
Blood Pressure (mmHg) ▪ Systolic BP ▪ Diastolic BP	131 89	29.3 11.5	14.3 10.9	0.004 0.003
Blood glucose (mg/dl)	189	56.7	21.33	0.0001
Cholesterol (mg/dl)	187	47.9	31.2	0.0005



Graph No.1: Bar graph showing frequency of Psychiatric disorders



Graph No.2: Line graph showing correlation of blood glucose and Cholesterol with Psychiatric disorders

Male predominated in present study. Male to female ratio was 1.83 vs. 1.0 (178 vs. 97) (p=0.0001). BMI ≥ 30 was noted in 26.5% of subjects. Systemic high blood pressures categorized as pre hypertension, stage 1 and 2 hypertension are shown in table II. Of 275 psychiatric subjects, normal blood glucose was noted in 79.6% and was raised in 20.3%. Similarly blood cholesterol as normal and elevated was noted in 65.09% and 34.9% respectively. Frequency of different psychiatric disorders is shown in table 2 and graph 1. Most common disorder noted were depression, anxiety, and MDD respectively. Stress disorders, behavioral disorders, anxiety, depression, GAD, and MDD showed positive correlation with blood glucose and blood

cholesterol levels as shown in graph 2. None of patient knew about their blood glucose and blood cholesterol levels in present study.

Table No.2: Characteristics of study population (n=275)

Parameter	No.	%	Chi value (X2)	p-value
Age				
· 20-29.9	37	15.1	11.09	0.002
· 30-39.9	83	30.1		
· 40-49.9	71	25.8		
· 50-59.9	63	22.9		
· ≥60	21	7.6		
Gender				
· Male	178	64.7	34.5	0.0001
· Female	97	35.2		
BMI (kg/m^2)				
· <18.5	56	20.3	35.7	0.0001
· 18.5 to 24.9	45	16.3		
· 25.0 to 29.9	101	36.7		
· ≥30	73	26.5		
Blood Pressure (mmHg)				
· Normal	117	42.5	45.7	0.0001
· Prehypertension	82	29.8		
· Stage 1 hypertension	37	13.4		
· Stage 2 hypertension	39	14.1		
Blood glucose (mg/dl)				
· Normal	219	79.6	56.3	0.0001
· Elevated	56	20.3		
Cholesterol (mg/dl)				
· Normal	179	65.09	46.3	0.0001
· Elevated	96	34.9		
Psychiatric disorders				
· Stress disorders	27	9.8	32.9	0.0001
· Behavior disorder	13	4.7		
· Anxiety	63	22.9		
· Depression	65	23.6		
· GAD	23	8.3		
· MDD	35	12.7		
· Psychosis	11	4		
· Schizophrenia	8	2.9		
· Dementia	3	1.09		
· Hysteria	12	4.3		
· OCD	7	2.5		
· Paranoids	8	2.9		

DISCUSSION

Our study showed frequency of elevated blood glucose, blood cholesterol, BMI and Systemic high blood pressure in 20.3%, 34.9%, 26.5% and 57.4% respectively as shown in table II. Our findings of blood glucose, blood cholesterol, BMI and systemic hypertension point towards the presence of metabolic syndrome in psychiatric patients. High blood glucose and blood cholesterol of 20.3% and 34.9% in present study is in keeping with previous studies.[1,4] Kamkar et al[4] has reported prevalence of 20.6% of metabolic syndrome in psychiatric patients in a study reported from Gorgan. Male population predominated in present study 64.7% compared to 65.2% reported by Olatunbosun[1], our finding is consistent. This is due to the fact that our society is male dominant. These days male are suffering more stress, anxiety and depression because they are the bread earners of family and are under stress all the time. In present study, elevated blood glucose levels were noted in 20.8% (n = 56) compared to 12.8% (n = 32) as cited.[1] Our finding of raised blood glucose levels is consistent to above cited study. The finding is also in agreement to a previous study reported by Codami et al[15]. Codami et al reported 10.2% (n = 82) diabetes mellitus (DM) out of total 800 psychiatric patients studied[15]. Frequency of DM is 2- 8 times more in psychiatric patients compared to general population.[16-18]

Female patients showed a frequency of 3.8% in present study which is comparable to previous study cited[1] who reported 4.0% frequency of DM among female in their study.

A previous study reported male were suffering more from DM contrary to female counterparts.[19] Finding of above study is in agreement to the present study as shown in table II. Mean age of present study is also consistent to previous studies which have reported same age group[1, 19]. A previous study from United States reported DM in psychiatric patients as a predictor of loss of productivity and economy[20]. In present study most of study subjects were not old, belonged to 4th decade and this is an indicator of loss of productivity and economy similar to above study. Table I and graph 1 shows the frequency of different psychiatric disorders. Most common disorder noted were depression, anxiety, and MDD respectively. Psychiatric disorders are summarized in graph 1. Stress disorders, behavioral disorders, anxiety, depression, GAD, and MDD showed positive correlation with blood glucose and blood cholesterol levels as shown in graph 2. Our findings are in contrast to Codami et al[15] where schizophrenia was prevalent, but frequency of psychiatric disorders is similar to other previous study[1,19,21]. Disturbed blood glucose and blood cholesterol are mediated through release of stress hormone, sedentary life style, physical inactivity and obesity which are established risk factors for glucose impairment[22]. Disturbed blood glucose and cholesterol was observed in 2.9% of Schizophrenics which is in agreement to Ryan et al[23] who reported 3.6% frequency of DM in schizophrenics. Four diabetic patients (1.6%) were found to have dementia in this study. Stress disorders, behavioral disorders, anxiety, depression, GAD, and MDD showed positive correlation with blood glucose and blood cholesterol levels as shown in graph 2. Above findings are in keeping with previous studies.[24, 25]

CONCLUSION

The present study concludes that the Stress disorders, behavioral disorders, anxiety, depression, GAD, and MDD are risk factors for raised blood glucose, blood cholesterol, BMI and Systemic hypertension. Raised blood glucose and blood cholesterol point towards metabolic syndrome and a predisposition of future diabetes mellitus and associated morbidities.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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