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TO STUDY THE PREVALENCE OF IMPAIRED ORAL GLUCOSE TOLERANCE TEST IN DRUG NAIVE SCHIZOPHRENIC PATIENTS IN COMPARISON WITH HEALTHY CONTROLS

Psychiatry

Dr Richa Choudhary Resident(MD), Department of Psychiatry, MGM Medical College Indore.

Dr Pali Rastogi* MD & Associate Professor,Department of Psychiatry, MGM Medical College Indore *Corresponding Author

Dr Ram Ghulam Razdan MD, Professor & HOD ,Department of Psychiatry, MGM Medical College Indore.

Dr Vijay Niranjan MD & Assistant Professor,Department of Psychiatry, MGM Medical College Indore

ABSTRACT

Background: Schizophrenia is a severe illness. Rate of type 2 diabetes is about 2-3 times higher as compared to the general population. We are intended to perform the oral glucose tolerance test in drug-naïve schizophrenia patients & determine whether the disease itself increase the risk of impaired glucose tolerance or not, it will guide the antipsychotic treatment & help in minimizing the risk & complications of metabolic impairment.

Material & Method: Two group i.e. drug naïve schizophrenia patients & healthy controls were recruited from OPD of psychiatry, M.Y and mental hospital, Indore. Assessment was done with oral glucose tolerance test.

Results: Mean fasting and 2hr blood sugar among cases and control were 81.2±15.9 & 116.08±25.7 and 83.1±12.1. & 115.7±20.2 respectively. Prevalence of impaired oral glucose tolerance test(OGTT) among cases & control was 15% and 3.3% respectively.

Conclusion: OGTT was significantly impaired in cases as compared to controls.

KEYWORDS

Schizophrenia, OGTT

INTRODUCTION

Schizophrenia is a neurodevelopmental disorder[1] Its incidence in world is approx. 1.5 per 10,000 people.[2] Approximately 0.3%-0.7% appears to be the lifetime prevalence of schizophrenia [3].4.0% is its median lifetime prevalence in world and 21 million people affected worldwide as of 2011.[4] In India Prevalence rate of schizophrenia ranges between 2.6 and 3.4 per 1000 [5]. An estimated 16,000 people in 2013 worldwide got affected and died with schizophrenia.[6]

It is difficult to determine whether schizophrenia per se has an independent role in the development of abnormal glucose metabolism or not as both conventional and atypical neuroleptics have been implicated in the pathogenesis of type II diabetes mellitus and impaired glucose tolerance[7,8,9]

Oral glucose tolerance test

Jerome W. Conn first described the glucose tolerance test in 1923 .[10]

It is a medical test in which glucose is given and blood samples taken afterward to determine how quickly it is cleared from the blood[11].It is usually used for diabetes, insulin resistance, impaired beta cell function.[12] In the most common version of oral glucose tolerance test (OGTT), a standard dose of about 75gm glucose is given to be taken by mouth and blood levels are checked after two hours.[13]

4-6% is the prevelance of impaired glucose tolerance in normal population. On comparing with healthy volunteers more than 15% of the drug-naive, first-episode patients with schizophrenia had impaired fasting glucose tolerance,.[14] But some studies found relation of First-episode psychosis with insulin resistance, impaired glucose tolerance, and the number of patients with impaired glucose tolerance, but not with fasting plasma glucose.[15]

MATERIAL AND METHODS

Study Place- Department of psychiatry, MGM Medical College and Mental hospital indore, after got clearance from institutional ethical committee of MGMMC, Indore.

Study design- case control cross sectional study.

Sampling Method- -It was a purposive sampling and case control study of 60 cases(drug naïve schizophrenic patients) and 60 controls (normal healthy subjects) after satisfying inclusion criteria and taking informed consent.

Procedure

We relied on data collected with the help of glucometer for OGTT. In two major groups the glucose values are assessed using OGTT cross sectionally only.

Procedure is done as following:-

- Glucose tolerance test is preferred to be conducted in the morning since it can exhibit a diurnal rhythm with a significant decrease in the afternoon.
- The patient is instructed fasting for 8–12 hours prior to the tests.
- In our study we have used capillary blood via finger prick and measurement of blood glucose is done with glucometer. Sensitivity and specificity is almost 100% with capillary blood and glucometer[13].
- Glucometer used was Bayer Contour TS which has shown good comparative results with the laboratory[9].
- The intervals and number of samples vary according to the purpose of the test. In our study we have drawn three samples fasting, 1 hrs and 2hrs after taking glucose of 75 g.[17] orally dissolved in 300 ml of water to Be Drunk in 5 minutes.
- But in results we evaluated oral glucose tolerance only with 2hrs glucose sample since it is the most commonly performed version.[13] Also it is approved from govt. of india[18].
- The fasting plasma Glucose level is upto 100 mg/dl in normal persons. Fasting levels between (110-125 mg/dL) are borderline (impaired fasting glycaemia)[19],
- For a 2 hour GTT (Glucose Tolerance Test) with 75g intake, a glucose level below (140 mg/dL) is normal,. Blood plasma glucose between (140 mg/dL) and (199 mg/dL) indicate "impaired glucose tolerance"[19],

Inclusion criteria-

1. Patient or legally accepted relative giving written informed consent.
2. Patients fulfilling criteria of schizophrenia (As per ICD-10).
3. Patient aged between 18-40 yrs

Exclusion criteria –

1. Pregnant female
2. History of endocrinopathy like Diabetes Mellitus.
3. Patient has taken treatment for schizophrenia.
4. Patient taking following drugs:-

Corticosteroids, Beta blocker, OCP, Thiazide diuretics, Epinephrine etc.

Statistical Method-
Data analysis done with spss software. We applied the Chi square test, P value less than 0.05 was considered as statistically significant.

RESULTS-

Results of prevalence of impaired OGTT in studied sample

Table 1. Blood sugar wise distribution of studied sample

Group	Mean fasting glucose	Mean 2hrs glucose
Cases	81.28±15.90	116.08±25.77
Control	83.18±12.12	115.76±20.20

Table 2 :Oral glucose tolerance test in studied sample

	Group			
	Case		Control	
	No.	%	No.	%
Normal OGTT at 2hrs	51	85	58	97
Impaired OGTT at 2hrs	9	15	2	3
Total	60	100	60	100

Pearson chi-square test = 4.9041, df = 1, p value = 0.026793

Prevalence of impaired OGTT in study sample
In cases out of 60, 9 had impaired oral glucose tolerance test 9/60=15 % prevalence. In control out of 60, 2 had impaired oral glucose tolerance test 2/60=3.3% prevalence

DISSCUSION

To determine whether the schizophrenia itself increases the risk of impaired glucose tolerance or not we conducted a study with 120 sample ,among them 60 were cases and 60 were controls.

Table 1 shows the results of mean fasting and 2hrs glucose levels. Among cases mean Fasting blood sugar is 81.28±15.90 and mean 2hrs sugar is 116.08±25.77. Among control mean Fasting blood sugar is 83.18±12.12 and mean 2hrs sugar is 115.76±20.20. The results of mean fasting glucose level is studied using Unpaired T test and Result was insignificant (p value-0.067).Studies showing similar results are:- **Kirkpatrick et al 2010** in their study of abnormal glucose tolerance in drug naïve patients with nonaffective psychosis applied fasting glucose and oral glucose tolerance test. There was no significant difference in fasting glucose. [20]

Table 2 shows the OGTT results between 60 cases and 60 control. Among case 51 had normal and 9 had impaired OGTT among control 58 had normal and 2 had impaired OGTT. Chi Square test was applied. Result was significant. This showed that number of subjects with impaired 2hrs OGTT were significantly higher in cases compared to control.

So the prevalence of impaired oral glucose tolerance test in our study was:- 9/60=15% prevalence in cases. 2/60=3.3% prevalence in control.

Studies favouring this results are:-
Fernandezegea et al 2009 in their study had aims to examine diabetes-related factors in newly diagnosed, drug naive people with non-affective psychosis and studied OGTT in them. prevalence of abnormal glucose tolerance found was 16% in psychosis group vs. 0% in control group.[21] **Kirkpatrick et al 2010** found that association with abnormal glucose tolerance would be present in an extended sample. In results, In contrast with the fasting glucose they found that 2 hrs glucose did differ significantly between the 2 groups[20]. **Saddichha et al 2008** conducted prospective study in india. Patient's screening and follow-up study of fasting and 2 hr post-prandial OGTT was done using 75 g glucose. A significant difference between the control group and the treatment group in 2 h post-prandial blood sugar was noted [22]. **Sattar H et al** 2016 studied the **Association Between First Episode Schizophrenia, Metabolic Syndrome and Insulin Resistance-Related Proteins in Female Balb/C Mice. OGTT was done and** Impaired glucose tolerance was found in schizophrenic group [23]. Dr **Benjamin Ian Perry, et al 2016** had studied an association between first-episode psychosis and abnormal glycaemic control. [24]. **D.C.Chen et al 2016** examined first-episode, drug-naïve Schizophrenic in-patients and compared them with healthy controls on OGTT to examine the relationship between impaired glucose tolerance and clinical phenotypes or cognitive deficits in studied subjects. Among the patients, 24.5% had Impaired Glucose Tolerance compared with none of the controls.[25]

CONCLUSION

We studied impaired glucose tolerance test in 60 drug naïve schizophrenia patients and 60 controls and compared the prevalence of OGTT among them. We performed OGTT with glucometer using capillary blood at hospital setting. Results were:

Mean fasting and 2hr blood sugar among cases and control were 81.28±15.90 & 116.08±25.77 and 83.18±12.12. & 115.76±20.20 respectively.

Prevalence of impaired OGTT among cases and control was 15% and 3.3% respectively.

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