

Prevalence of Impaired Oral Glucose Tolerance in Patients with Polycystic Ovarian Syndrome

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ABSTRACT

Objectives: To find the prevalence of PCOS in patients with menstrual irregularities and then to find the prevalence of impaired glucose tolerance among patients with PCOS.

Study design: Descriptive cross sectional

Place and Duration of Study: Department of Obstetrics and Gynecology, District Headquarter Hospital, Gujranwala from 1st November 2017 to 2nd May 2018.

Methodology: Two hundred and twenty threepatients with menstrual irregularities were included In the study. Rotterdam classification criteria were used for proper identification of polycystic ovarian syndrome facilitated by clinical investigation. These patients were called for the oral GTT as explained in operational definitions. All blood samples were sent to our hospital laboratory.

Results: Mean age of women was 32.54±7.54 years. Among women, 120 (53.8%) had family history of diabetes. Impaired glucose tolerance was confirmed in 55(24.7%) patients. Women who were diagnosed with PCOS among them impaired glucose tolerance was confirmed in 20(18.2%) patients.

Conclusion: Glucose tolerance frequency was not significantly higher. However elderly and obese women had higher frequency of impaired glucose tolerance.

Key words: PCOS, Menstrual irregularities, Impaired, Glucose, Tolerance

INTRODUCTION

During the reproductive age, polycystic ovarian syndrome is the most common fecundity problem among females occurred due to endocrinological disruption. It is also one of the main cause of infertility among the child bearing age women.¹ Its prevalence varies from 6-12% among different regions of the world.² The pathological process behind the phenotype appearance of PCOS is complex and the most accepted model suggests the abnormalities in the metabolism of androgens and estrogens accompanied by a problem in the control of production of androgens. Now days, the main diagnostic criteria for the PCOS is the Rotterdam criteria, which has been followed in most of the literature.³

The PCOS is strongly associated with metabolic syndrome which may manifest with or without endocrinal and gynecological features. The metabolic syndrome has many features like high blood pressure, insulin resistance, central obesity as well as increased serum lipid levels etc.⁴

The insulin resistance is more prominent among other features. All these metabolic factors especially hyperglycemia and dyslipidemia increase the susceptibility of individual for cardiovascular and cerebrovascular diseases at early age as compared to healthy individuals. The early and prompt control of these lead to better outcomes.³ A study in 2016 found that incidence of PCOS in normal population is 7.7% and prevalence of impaired oral glucose tolerance among patients with PCOS was 19.9%.⁵ The impaired glucose tolerance may manifest as prediabetes or diabetes.⁶

MATERIALS AND METHODS

The study had a descriptive-cross sectional design. It was performed at Department of Obstetrics and Gynecology, District Headquarter Hospital, Gujranwalawithin the duration of 1st November 2017 to 2nd May 2018 and comprised 223 patients of PCOS. Patients with menstrual irregularitiesand age range of 20 to 45 years were included. Immunocompromised patients including corticosteroid therapy, previous history of any chemotherapy or radiotherapy, any history of repeated infections, previous history of diabetes, H/O drug or alcohol abuse, deranged liver and kidney functions and breast feeding were excluded. After detailed history,

clinical examination and relevant investigations thepatients with PCOS wasidentified based on Rotterdam criteria were recorded. These patients were called for the oral GTT as explained in operational definitions. All blood samples were sent to our hospital laboratory and a record of data was maintained. Data was entered and analyzed through SPSS-22.

RESULTS

Mean recorded age of women in this study was 32.54±7.54 years. One hundred and twenty (53.8%) had family history of diabetes. Eighty five (38.1%) women's BMI was normal, 71 (31.8%) were overweight and 67 (30.5%) were obese. PCOS was diagnosed in 110 (49.3%) women. Impaired glucose tolerance was confirmed in 55 (24.7%) patients (Table 1). Women who were diagnosed with PCOS among them impaired glucose tolerance was confirmed in 20 (18.2%) patients (Table 2).

Table1: Patient's demographical information (n=223)

Variable	No.	%
Age (years)	32.54±7.54	
Family history of diabetes		
Yes	120	53.8
No	103	46.2
Body mass index (kg/m ²)		
Normal	85	38.1
Overweight	71	31.8
Obese	67	30.0
Diagnosis of PCOS		
Yes	110	49.3
No	113	50.7
Glucose Tolerance Test		
Impaired	55	24.7%
Normal	168	75.3%

Table 2: Impairedglucose toleranceamong patients of PCOS

GTT	PCOS		Total
	Yes	No	
Impaired	20 (18.2%)	9 (8%)	29
Normal	90 (81.8%)	104 (92%)	194
Total	110	113	223

Chi-Square Test= 5.143

p-value= 0.023

DISCUSSION

Result of the present study suggests that, glucose impairment was not much higher as it was only confirmed in 20 (18.2%) PCOS patients. Findings of another study also reported the similar results.⁵ Result of an Asian studies also highlighted that incidence of glucose intolerance in PCOS women was not much higher^{7, 8} while the Korean study demonstrated that frequency of glucose intolerance in PCOS women was 28-fold higher.⁹

In the present study, elderly age group (>40 years: 30%) had higher incidence of glucose intolerance as compared to the young participants. Indian study also reported the similar results.⁷ Findings of Legro et al¹⁰ and Trolle and Lauszus¹¹ also proved an elevated chances of glucose impairment in older females and who had higher BMI. International studies reported that frequency of glucose intolerance is significantly associated with increased BMI. However, in the current study, similar trend was observed that incidence of glucose impairment in PCOS patients was much higher in obese females i.e. 36.4% in contrast to lean girls. Researches also highlighted that PCOS women are more towards obesity and vice versa which not only exacerbate the chances of related insulin resistance but also increased the chances of reproductive and metabolic disorders. Insulin resistance plays a major role in the contribution of fecundity problems and affect overall ovarian steroidal hormone synthesis.¹³

The important cause of hyperinsulinemia is due to increased basal insulin secretion, decreased insulin clearance and also due to dysfunction of pancreatic P-cells.^{16,17} As PCOS women are more commonly exhibit glucose intolerance and insulin resistance, these two together elevated the risk of type 2 diabetes mellitus and cardiovascular diseases in these females.^{14, 15} Early screening for glucose intolerance reduces the chances of these comorbidities.

CONCLUSION

Incidence of glucose-intolerance was not statistically higher in present study as compared to the reported literature. Obese and elderly women were more towards glucose impairment. It is highly recommended that PCOS women with glucose intolerance should be screened annually as they have elevated chance of type 2 diabetes development. Lifestyle modifications, weight loss strategies and maintaining normal BMI could prove beneficial for PCOS patients.

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