ORIGINAL ARTICLE

# Frequency of hyperglycemia in patients of polycystic ovaries in Department of Gynecology, B. V. Hospital, Bahawalpur

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## ABSTRACT

**Aim:** To determine the Frequency of hyperglycemia in patients of polycystic ovaries in Department of Gynecology, Bahwal Victoria Hospital, Bahawalpur

**Methods:** This cross sectional study was conducted at Gynae Outpatient Department Bahawal Victoria Hospital and analyzed in Quid-e-Azam Medical College Pathology laboratory Bahawalpur from November, 2013 to May, 2014. Total 289 diagnosed cases of polycystic ovaries of reproductive age 13-35 years and BMI > 23 were included in this study.

**Results:** Mean age of the patients was 22.15±4.24 years. Hyperglycemia was found in 86(29.76%) patients. Majority of the patients were between 13-20 years of age i.e., 153(52.94%) and hyperglycemia was found in 19(12.42%) patients, 167(57.79%) patients were obese and 119(41.18%) patients were with family history of PCO.

**Conclusion:** The frequency of hyperglycemia is high among patients presenting with polycystic ovarian syndrome. However, it is required that every setup should have their surveillance in order to know the frequency of the problem.

**Keywords:** Polycystic Ovarian Syndrome, Hyperglycemia, IGT, obesity

## INTRODUCTION

Polycystic ovaries are an exceptionally common disorder of premenopausal women .It is about 5-10% in a woman of reproductive age[1]. There is a documented correlation between polycystic ovaries and hyperglycemia. According to different studies about 70% of polycystic females have insulin resistance, 10% will develop type Diabetes Mellitus in following few terms[2,3]. In another study it was revealed that out of 100 normoglycemic females 35%developed Impaired glucose tolerance in next 6 years[4]. Its prevalence is higher in adolescent so assessment of glucose metabolism is more important in young girls with polycystic ovaries[5,6].Beside relation of Impaired glucose tolerance test or Type 2 Diabetes Mellitus with polycystic ovaries it is also seem women with polycystic ovaries has high risk of developing gestational diabetes. Polycystic morphology is a common finding among women with history of gestation diabetes mellitus[4]. Due to all above mentioned facts disease represents an important target population for Diabetes control. As well women with impaired glucose tolerance should be treated because it is first step to progress to Diabetes Mellitus and coronary artery disease. Reduction in insulin and androgen will prevent impaired glucose tolerance and Diabetes Mellitus and will improve ovulation. In teenagers abnormalities of

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glucose metabolism manifest prior to dyslipidemia suggesting that assessment of glucose metabolism is even more important in younger women[7,8]. In city like Bahawalpur due to lack of education awareness and social problems of menstrual abnormalities are least discussed and diagnosed. Due to all these facts it is very important to diagnose hyperglycemia in patients with PCO's as early as possible to prevent long-term complication of diabetes mellitus in such patients.

## MATERIAL AND METHOD

This cross sectional study was conducted at Department of Gynecology, Bahawal Victoria Hospital and analyzed in Quid-e-Azam Medical College Pathology laboratory Bahawalpur from November, 2013 to May, 2014. An approval was taken from institutional review committee and a consent was taken from every patients. Total 289 diagnosed cases of polycystic ovaries of reproductive age 13-35 years and BMI > 23 were included in this study. Known cases of diabetes mellitus, patients taking oral contraceptive pills and steroids and patients high grade fever (102 F) were excluded from the study. Patients were diagnosed as a case of PCO's if three out of four things are present.

Amenorrhea: Women with mean cycle of >180 days, 2. Oligomenorrhea\amenorrhea, women with mean cycle length>35days and amenorrhea >180 days, 3. Clinical signs of hyperandrogenism, e.g., hirsutism, androgenic alopecia or acne, 4. Polycystic ovaries on USG more than 8-10 follicles of 2-8 mm in size. 2 ml of blood for fasting serum glucose level

was taken and serum were extracted immediately after blood collection through centrifuging at 2000 rpm, after that 75 gm of oral glucose was given to the patients and 2ml of blood was collected after 2 hrs for serum glucose level estimation.  The entire test was performed on fully automated chemistry analyzer SELECTRA E and the serum glucose level will be measured in units of mg/dl.  Patients with blood glucose level of 140-200mg/dl after 2hrs were considered as impaired glucose tolerance and patients were labeled as hyperglycemia. Data was analyzed using SPSS 16. Mean and SD was calculated for numerical data and frequencies and percentage were calculated for categorical data. Chi-square test was applied as test of association. P. value ≤0.05 was considered as significant.

## RESULTS

Total 289 patients were include in this study. Mean age of the patients was 22.15±4.24 years. Out of 289 patients with PCOS, hyperglycemia was found in 86 (29.76%) (Fig. 1). Age distribution of the patients was done, majority of the patients were between 13-20 years of age i.e., 153(52.94%), 93(32.18%) between 21-30 years and 43(14.88%) between 31-35 years of age. Hyperglycemia was found in 19(12.42%), 29(31.18%) and 38(88.37%) patients in age groups 12-30 years, 21-30 years and 31-35 years respectively. Association between hyperglycemia and age was not significant statistically P value 1.00 (Table 1). Out of 289 patients obese was 167(57.78%) and hyperglycemia was found in 65(38.92%), out of 122 (42.21%) non-obese, hyperglycemia was found in 21(17.21%) patients. Highly significant association was seen between hyperglycemia and obesity. P value 0.000. (Table 2). Total 119(41.18%) patients were found with family history of PCO and hyperglycemia was noted in 57(47.9%) patients. Among the 170(58.82%) patients without family history of PCO, hyperglycemia was noted in 29 (17%). Significant association was seen between hyperglycemia and family history of PCO P value 0.000 (Table 3).
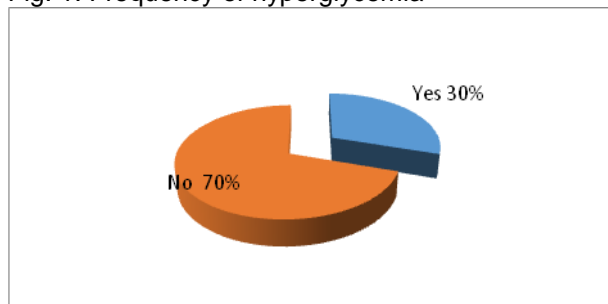
Fig. 1: Frequency of hyperglycemia



Table 1: Age stratification of the patients

| Age (years) | Hyperglycemia | | Total |
|---|---|---|---|
| | Yes | No | |
| 13-20 | 19(12.42) | 134(87.58) | 153(52.94) |
| 21-30 | 29(31.18) | 64(68.82) | 93(32.18) |
| 31-35 | 38(88.37) | 5(11.63) | 43(14.88) |

P value: 1.00

Table 2: Stratification for obesity

| Obesity | Hyperglycemia | | Total |
|---|---|---|---|
| | Yes | No | |
| Obese | 65(38.92) | 102(61.08) | 167(57.79) |
| Nonobese | 21(17.21) | 101(82.79) | 122(42.21) |

P value: 0.001

Table 3: Stratification for family history

| Family history | Hyperglycemia | | Total |
|---|---|---|---|
| | Yes | No | |
| Yes | 57(47.9) | 62(52.1) | 119(41.18) |
| No | 29(17) | 141(83) | 170(58.82) |

P value: 0.001

## DISCUSSION

Impaired glucose tolerance (IGT), a state characterized by mild elevations in blood glucose levels, typically antedates the onset of NIDDM[9]. However, IGT is under diagnosed, even in populations at high risk[10,11], because it is usually asymptomatic and its detection requires an oral glucose tolerance test (OGTT). With appropriate lifestyle or pharmacological intervention, it may be feasible to delay, or possibly prevent, the deterioration from IGT to NIDDM[12,13]. Thus, great emphasis has been placed recently on earlier detection of IGT[14].

Women with polycystic ovary syndrome (PCOS) are an ideal population in which to identify individuals with IGT for several reasons. In conjunction with the reproductive dysfunction that characterizes the syndrome, PCOS carries an increased risk of development of NIDDM[1516,17,18]. In addition, PCOS is estimated to affect up to 10% of women of reproductive age, making it one of the most common endocrine disorders in this population. Finally, the manifestations of androgen excess typically bring patients with PCOS to clinical attention early in life, when NIDDM is rarely evident, but when strategies for its prevention may be optimally implemented.

While the association between androgen excess and diabetes was first noted some 90 years ago[19], the precise mechanisms that underlie the pathogenesis of abnormal glucose tolerance in PCOS have yet to be established, and our understanding of the natural history of glucose tolerance among those with the disorder remains incomplete.

In city like Bahawalpur due to lack of education awareness and social problems of menstrual abnormalities are least discussed and diagnosed. Due to all these facts it is very important to diagnose hyperglycemia in patients with PCO's as early as possible to prevent long-term complication of diabetes mellitus in such patients, however, we evaluated the frequency of hyperglycemia in subjects with polycystic ovaries which was recorded in 86(29.76%).

In two of the largest studies (>100 women) that documented the prevalence of IGT and type 2 DM in women with PCOS, it was estimated that IGT is present in 31–35% of women with PCOS[20,21]. In addition, type 2 DM, classified according to the World Health Organization (WHO) criteria, is present in 7.5–10% of women with PCOS. Compared with the prevalence of IGT (1.6%) and DM (2.2%) found in U.S. women of similar age in the Third National Health and Nutrition Survey[22], the rates in women with PCOS are considerably higher. In addition, IGT and type 2 DM are also highly prevalent among adolescents with PCOS. In one study, IGT was present in eight of 27 (29.6%), and type 2 DM was present in two of 27(7.4%) adolescent girls with PCOS[23].

The above findings are highly correlated with the findings of our study, another finding of the current study reveals that a higher proportion of the subjects were obese while during stratification we further recorded that 75.58% of the obese patients had hyperglycemia/IGT, these findings are in accordance with Liang SJ and co-workers[24] who revealed that obese women with PCOS had significantly higher insulin resistance than obese normal control women. Logistic regression analysis showed that obesity was the only factor that predicted impaired glucose tolerance and metabolic syndrome. Use of the area under the receiver operating characteristic curve (AUROC) for the body mass index to predict impaired glucose tolerance and metabolic syndrome was more accurate than AUROCs for serum total testosterone level and the average menstrual interval.

The limitation of the study was that we did not included any control group for age matched population, but the other studies as mentioned above are of the view that hyperglycemia/IGT is significantly higher in patients presenting with PCO.

However, in light of the above discussion, it is established that the Frequency of hyperglycemia in patients of polycystic ovaries in Gynae department, Bahwal Victoria Hospital, Bahawalpur is higher.

## CONCLUSION

The frequency of hyperglycemia is high among patients presenting with polycystic ovarian syndrome. So, it is recommended that every patient who present with PCO, should be sort out for hyperglycemia. However, it is also required that every setup should have their surveillance in order to know the frequency of the problem.

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