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Research Article

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**A PRELIMINARY STUDY OF CLINICAL MANIFESTATIONS OF POLYCYSTIC OVARY SYNDROME (PCOS) IN KOLKATA**

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**ABSTRACT**

Women with polycystic ovarian syndrome (PCOS) represent a unique population, with long term implications on fertility, obesity and diabetic complications, which need to be addressed. In our study 80 consecutive PCOS women were screened. The prevalence of various clinical parameters like menstrual irregularities, obesity, hypertension, thyroid problem and diabetes were compared between case-control groups. It was observed that 78.75% PCOS patients had abnormal menstrual cycle. 10% of the PCOS patients were found to be obese whereas in case of control group the percentage were shown is only 3.75%. We found BMI and PCOS were significantly associated (p-value <0.0001). But we did not find any significant association of waist-hip ratio with PCOS (p-value is 0.2120). 25% of the PCOS patients were hypertensive. Thyroid disorder was reported in 25% in PCOS and 2.5% in control group. These PCOS women who were more obese had a significantly higher prevalence of glucose intolerance compared to control women (P= 0.005). The goal of this study was to help improve awareness and discuss the clinical implications of the coexistence of these disorders in this particular patient population.

**Keywords:** Polycystic ovary syndrome (PCOS), menstrual irregularity, hypothyroidism, diabetes, obesity.

**INTRODUCTION**

Polycystic ovarian syndrome is one of the most common female endocrine disorders. It is currently known to affect up to 10% of women of reproductive age and is one of the notable factors of female sub fertility (Ehrmann, D 2005). The prevalence of menstrual irregularity has been addressed in several studies. PCOS is a common hyperandrogenic disorder in women of child bearing age group (Frank S et al., 2001). It is a multi system metabolic disorder which has a major impact on quality of life and fertility (Elsenbruch S et al., 2003). The aim of the study was to determine the prevalence of various clinical manifestations in obese and non obese PCOS women. The prevalence of obesity is increasing across the world particularly in the developed

countries (Balen AH et al., 1995). Upper - body obesity (android obesity) is common adverse health factor. There is overwhelming evidence that Upper – body obesity is major risk factor for cardiovascular disease and type 2 Diabetes Mellitus, whereas lower body obesity is not. Upper – body obesity diagnosed by measurement of waist – hip ratio (WHR), waist circumference, CT scan and MRI imaging (Robert J et al., 2002). Early stages of thyroid dysfunction may lead to subtle change in ovulation and endometrial receptivity, which may have profound effect on fertility. In adult woman, severe hypothyroidism may be associated with diminished libido and failure of ovulation, ovarian atrophy and amenorrhoea or menstrual irregularity. It is interesting to note that both PCOS and thyroid dysfunction are related to

each other. Hypothyroidism is known to induce a clinical manifestation similar to PCOS (Wajner, SM 2009; Raber, W 2003; Setian, NS 2007). The aims and objectives of the present work were to analyse and correlate the biological parameters (body-mass index, waist-hip ratio, blood sugar level, diabetic history in family, hypertension and thyroid problem) in women with Polycystic Ovarian Disease or Syndrome.

## **MATERIALS AND METHODS**

This prospective study was done from April 2015 to July 2015 among the students in the Ballygunge Science College Campus, University of Calcutta, West Bengal. A total of 160 women with consent, aged 20-33 years were enrolled in the study. The subjects were divided into two groups (patients and controls). The case group consisted of 80 women with Polycystic Ovarian Disease (PCOD) or syndrome. The control group consisted of 80 age matched females without PCOS or PCOD. The participation of the respondents was voluntary. All subjects answered a questionnaire which contained details of age, menstrual history, thyroid problem, height, weight, waist-hip ratio, blood sugar level, family history of diabetes and hypertension. Their height, weight, BMI (Body Mass Index) and waist-hip circumference were measured using standard protocol.

## **RESULTS**

### **Menstrual Cycle Irregularity**

Among the 80 PCOD patients, menstrual cycle is irregular in 24 cases and delayed in 39 cases. 63 out of 80 (78.75%) has abnormal menstrual cycle whereas only 4 has menstrual irregularity among 80 (5%) in the control group (Figure 1 & 2).

### **Thyroid Problem**

Thyroid problem that was observed in 20 out of 80 (25%) patients with PCOD as compared to only 2 of control population (2.5%) (Figure 3 & 4).

### **BMI**

The percentage of obesity in control population is 3.75% (3 out of 80) whereas 10% (8 out of 80) in PCOD patients (Figure 5 & 6).

### **Waist-Hip Ratio**

30 % (24 in 80) in control group and 32.5% (26 among 80) in case were found in the position of "At Risk" (Figure 7 & 8).

### **Blood sugar level**

21 individuals in case were reported to have high level of blood glucose level, and 45 out of 80 cases had family history of Diabetes mellitus (Figure 9 & 10).

### **Hypertension**

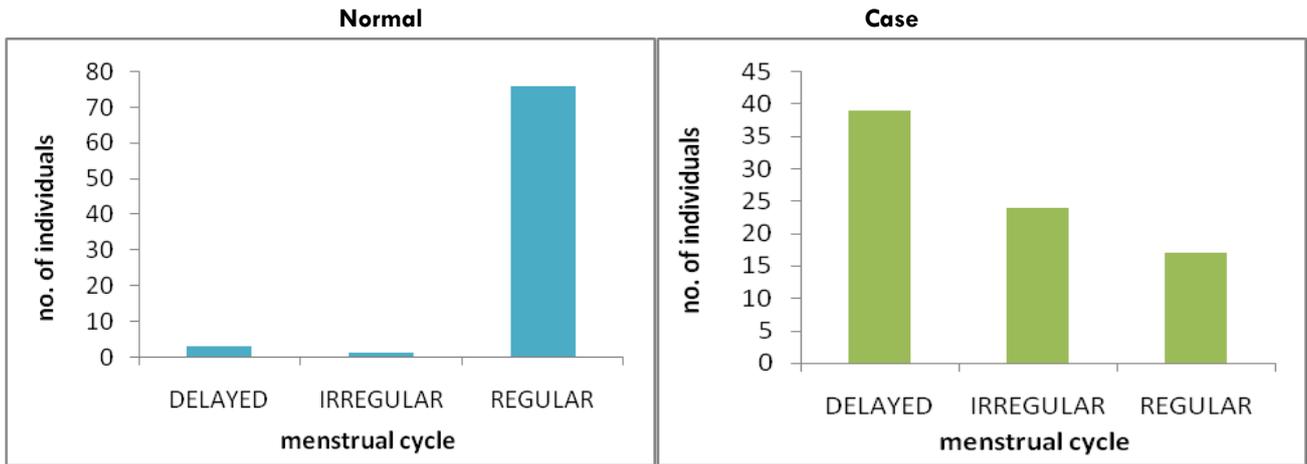
20 PCOD patients (25%) are hypertensive but in normal, it is only 12.5% (Figure 11 & 12).

## **DISCUSSION**

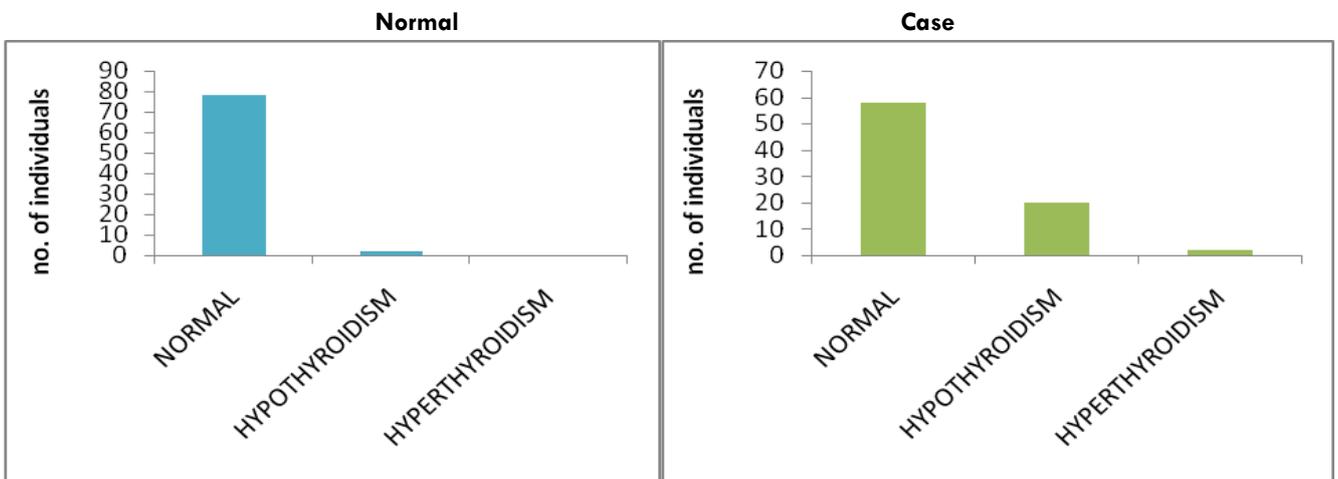
Globally, there is an alarming increase in the rate of polycystic ovary disease. PCOD is becoming an emerging problem that needs careful assessment, timely intervention, and appropriate treatment. However, it is important to make an early diagnosis in order to prevent early and late sequel of the disease. The present study was conducted to know how prevalence of PCOS is associated with BMI, obesity, thyroid malfunction, high blood sugar level, hypertension and waist-hip ratio of the women within age group of 20-33 years.

In our study it was observed that 63 out of 80 (78.75%) has abnormal menstrual cycle whereas only 4 has menstrual irregularity among 80 (5%) in the control group. Balen et al has reported that menstrual disturbances were seen in 72% of the PCOS women. Among them oligomenorrhoea (60%) was the commonest followed by amenorrhoea (11%) (Balen A. H et al., 1995).

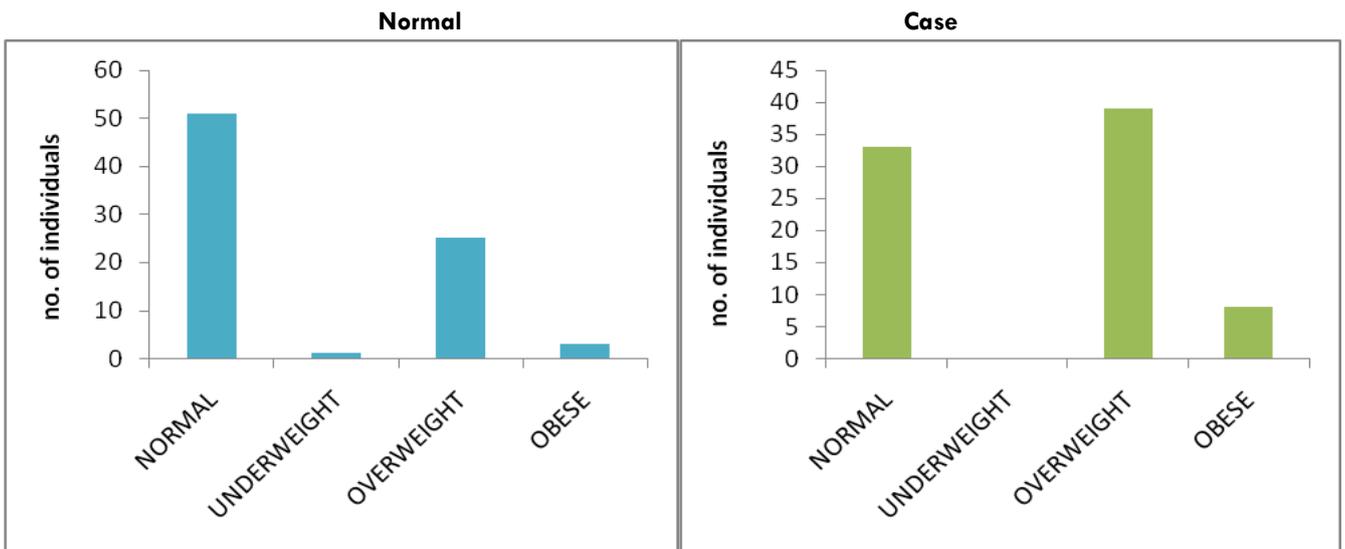
In developing nations, obesity is mainly caused by sedentary lifestyle, physical inactivity and consumption of high calorie rich foods. India is currently observing a rise in the numbers of individuals in the middle-class who are detected with obesity. Obesity is highly observed in the PCOS patients (Ehrmann, D 2005). It has been observed in our study that 10% of the PCOD patients were found to be obese whereas in case of control group the percentage has been shown is only 3.75%. So we found BMI and PCOS was significantly associated ( $p$ -value  $<0.0001$ ). Similar results were reported by Majumdar et al where in the prevalence rate of obesity was 37.5% (Majumdar, A and Singh, TA 2009). Lim et al in a systemic review and meta-analysis concluded that women with PCOS had a greater risk of overweight, obesity and central obesity (Lim S et al., 2012). But we did not find any significant association of waist-hip ratio with PCOS ( $p$ -value is 0.2120). These suggest that although obesity increases the prevalence rates of PCOS to a modest degree, the metabolic consequences of obesity may precipitate a



**Figure 1** **Figure 2**  
**Figure 1 and 2:** Profile of menstrual cycle in normal and case



**Figure 3** **Figure 4**  
**Figure 3 and 4:** Profile of thyroid problem in normal and case



**Figure 5** **Figure 6**  
**Figure 5 and 6:** Profile of obesity in normal and case

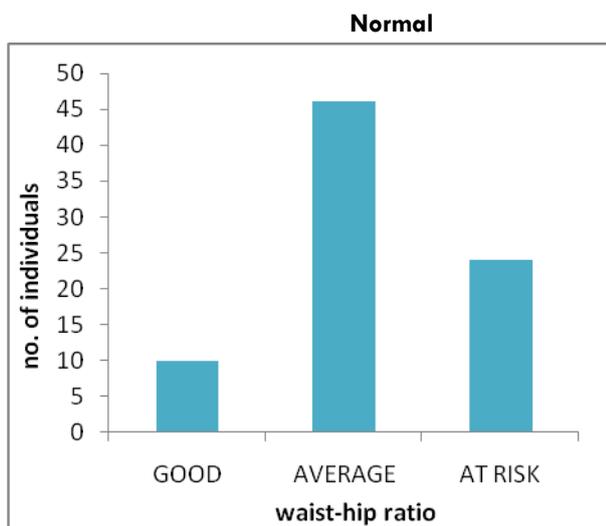


Figure 7

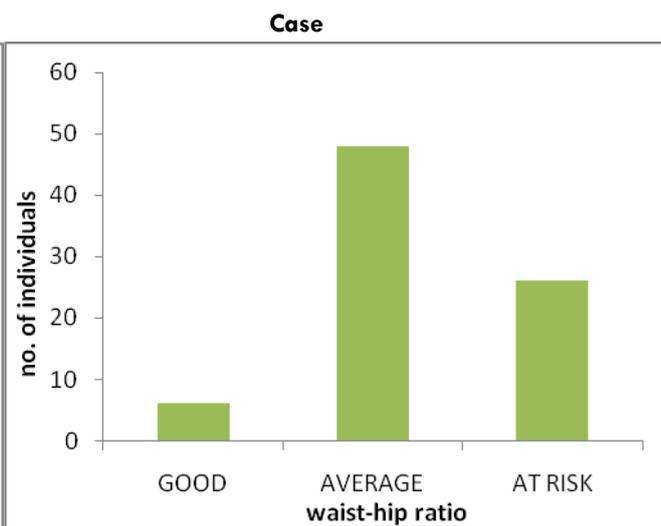


Figure 8

Figure 7 and 8: Profile of waist-hip ratio in normal and case

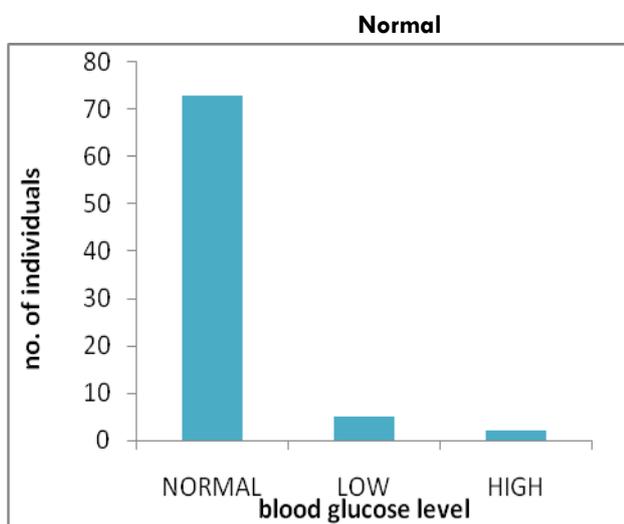


Figure 9

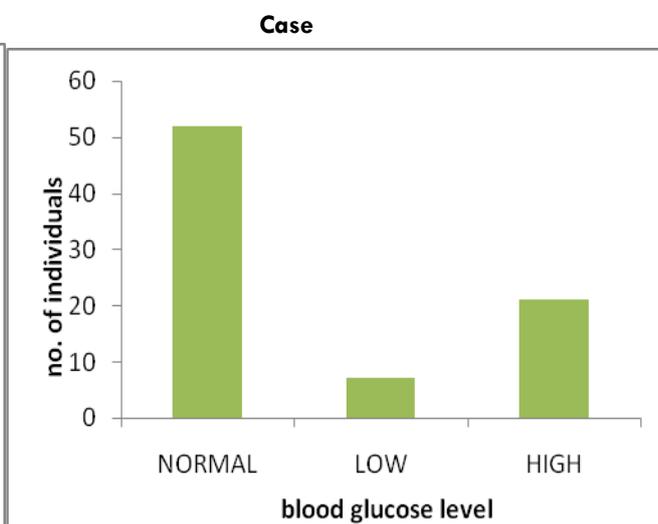


Figure 10

Figure 9 and 10: Profile of blood sugar level in normal and case

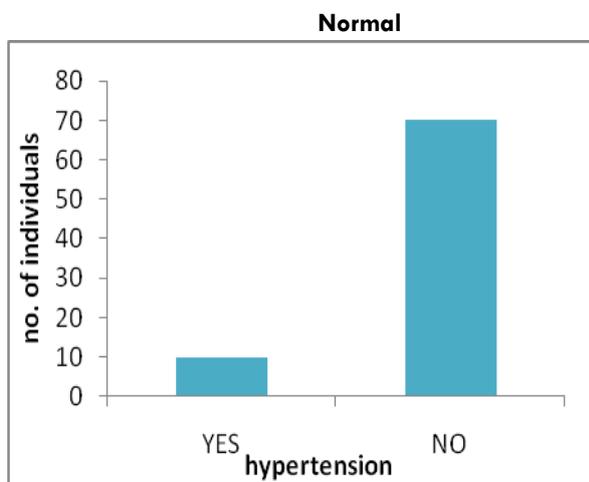


Figure 11

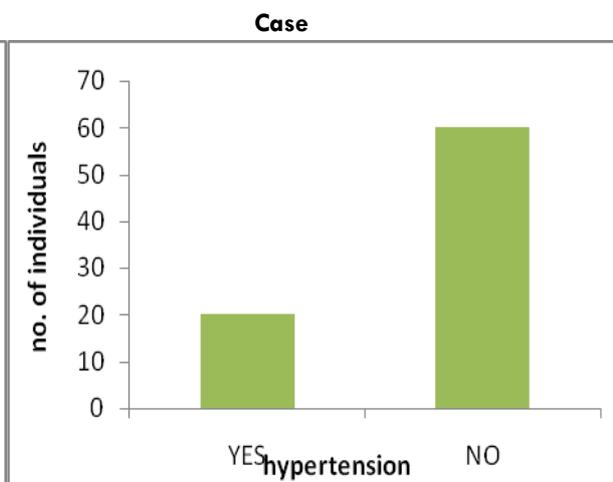


Figure 12

Figure 11 and 12: Profile of hypertension in normal and case

genetically susceptible individual to express the PCOS phenotype. Several studies suggest an increased prevalence of hypertension in PCOS women compared to general population. The relation between PCOS and hypertension was significantly observed in our study. 25% of the PCOS patients were hypertensive whereas 12.5% hypertensive individuals were noted in control group. However the PCOS population was significantly more obese and the obesity could be responsible for the greater prevalence of hypertension in the population. Another disorder which has more or less similar symptoms and complications as PCOS is thyroid dysfunction and it is interesting to note that both PCOS and thyroid dysfunction are related to each other. Thyroid dysfunction in PCOS is characterized by either subclinical hypothyroidism or autoimmune thyroiditis both being involved in latent progression to hypothyroidism. Recently a prospective case-control study undertaken in Indian schools revealed a significant association between thyroiditis and PCOS in girls suffering from euthyroid chronic lymphocytic thyroiditis (Ganie MA et al, 2010). Thyroid malfunction was also reported in a high rate in PCOS patient. Thyroid disorder was reported in 25% in PCOS and 2.5 % in control group.

Both thyroid dysfunction and PCOS have similar complications and the dual presence of these would definitely come in the way of the management of the syndrome. Hypothyroidism is known to induce a clinical manifestation similar to PCOS (Wajner, SM 2009; Raber, W 2003; Setian, NS 2007) and therefore all existing criteria used for the diagnosis of PCOS aim to first exclude hypothyroidism. Women with polycystic ovary syndrome are insulin resistant, and at high risk for glucose intolerance. The syndrome is usually associated with insulin resistance, obesity, and type 2 diabetes mellitus (Heather, R 2001). Research suggests that insulin resistance can also occur in many types 1 diabetics (Corbould, A 2005). PCOS and hyperandrogenism have been reported in many patients with type 1 diabetes. 21 individuals in case were reported to have high level of blood glucose level, and 45 out of 80 cases had family history of Diabetes mellitus. These PCOS women who were more obese had a significantly higher prevalence of glucose intolerance compared to control women (P= 0.005).

Based on the observation it is concluded that the prevalence of PCOS is increasing gradually in India and it may be a major health concern in future. The approach to managing these patients involves addressing the patient's dominant symptom as well as the metabolic consequences of the disease. Hence, early diagnosis and intervention will reduce the long term health complications associated with PCOS.

#### Conflict of interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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