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# Assessment of Risk Factors for Developing PCOS: A Questionnaire based Study

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**Abstract:** ***Introduction: Polycystic Ovarian syndrome (PCOS) is a triangle of Obesity, Amenorrhea and Hirsutism. The common features of PCOS are irregular or an ovulatory cycle with signs of hyperandrogenism like acne, seborrhea, hirsutism, alopecia, and with polycystic ovaries. Objectives: 1) To understand the common factors between PCOS Group and Non PCOS Group. 2) To get an idea about PCOS common symptoms and subjects will be able to take suitable preventive measures. Materials and Methods: A Total of 96 female participants 48 PCOS females and 48 NON PCOS females were included in the study after obtaining voluntary, informed consent by simple random sampling. This questionnaire based study included females of reproductive age. A questionnaire consisting of 26 questions related to PCOS prepared in accordance with the available literature and gynaecologist's opinion. Questions were circulated and collected data were analysed. Statistical Analysis: Statistical analysis was done using IBM SPSS 20.0 (SPSS Inc., Chicago, USA). Continuous variable age was presented by Mean±SD. Categorical variables are expressed as frequency and percentage. To test the statistical significance of the mean difference in the age between PCOS and Non PCOS group, independent sample t test was applied. To test the statistical significance of the difference in the categorical variables between PCOS and Non PCOS group, Chi - square test will be applied. To find the most significant predictors of PCOS, multivariate binary logistic regression analysis was used. A p value < 0.05 was considered as statistically significant. Result: The results of the multivariate analysis showed that Unpredictable periods was the most significant factor for PCOS (p value<0.001, Odds Ratio (95% CI) - 5.8 (2.16, 15.6). Family history of other diseases (p value=0.002) and Hypoglycaemia (p value=0.058) were independent factors. Conclusion: This study helped in identifying the unpredictable periods as the significant factor among the two groups (48 each) - PCOS and non PCOS groups, which was administered through a standardized questionnaire.***

**Keywords:** Polycystic Ovarian syndrome, PCOS, Obesity, Amenorrhea, Hirsutismm, hyperandrogenism

## 1. Introduction

Polycystic ovarian syndrome (PCOS) or Polycystic Ovarian Disorder (PCOD) is a triangle of obesity, amenorrhea and hirsutism. [1] PCOS is also referred to as the 'Syndrome O' due to overproduction of insulin, over- nourishment, ovulatory disruption and ovarian confusion. [1]

The common features of PCOS are irregular or an ovulatory cycle with signs of hyperandrogenism like acne, seborrhea, hirsutism, alopecia, frank virilization, and with polycystic ovaries. [3]Recently, it has been associated with obesity, insulin –resistance (IR) and a risk of developing Type 2 diabetes mellitus (T2DM). [3] It may be perceived as a cosmetic issue because of hirsutism and acne, or as agynaecological concern that causes irregular menses and reduced fertility. [3]Proper diagnosis and management of the patient is important. [3]

Some of the investigations used for PCOS are ultrasound scan, laparoscopy, hormonal investigations and hysteroscopy. [4]Treatment is majorly directed at the immediate presenting complaint and the treatment of infertility for overweight women should always include weight loss, exercise, food control and skin care. [4]

Considering the magnitude and consequences of PCOS compounded by the social apprehensions related to the nature of problem, it is important to assess its occurrence in the young adults. [5] It is not clear what are the factors that may predispose a woman for development of PCOS, however it was observed in some cases that PCOS is genetic in nature and obesity was found to contribute for hyperinsulinemia there by predisposing individuals for PCOS. [11]

## 2. Materials and Methods

The questionnaire based study was conducted in females of reproductive age to understand the common factors between 2 groups (PCOS & Non PCOS Group) and also to get an idea about PCOS common symptoms. This study was conducted on 96 subjects which were grouped into 2 with 48 individuals in each group. Group 1 consistd of PCOS subjects and group 2 consist of NON PCOS subjects. The study was conducted in Little Flower Institute of Medical Science and Research, Angamaly, were individuals selected by simple random sampling. The study group responded to a questionnaire of PCOS self - assessment [1] form.

### Inclusion Criteria

- Women with PCOS and without PCOS.
- Women at reproductive age.

### Exclusion Criteria

- Women with amenorrhea of menopause.

**Statistical Analysis**

Statistical analysis was done using IBM SPSS 20.0 (SPSS Inc., Chicago, USA). Continuous variable age was presented by Mean±SD. Categorical variables are expressed as frequency and percentage. To test the statistical significance of the mean difference in the age between PCOS and Non PCOS group, independent sample t test was applied. To test the statistical significance of the difference in the categorical variables between PCOS and Non PCOS group, Chi - square test will be applied. To find the most significant predictors of PCOS, multivariate binary logistic regression analysis was used. A p value < 0.05 was considered as statistically significant.

## 3. Results

A total 96 women of reproductive age were take part in this study. The study population consists of women of 2 groups - PCOS (n=48) and Non PCOS Group (n=48).

**Table 1:** Comparison of age between two groups

| Group | n | Mean | Std. Deviation | p value |
|---|---|---|---|---|
| PCOS | 48 | 26.46 | 4.8 | 0.250 |
| Non PCOS | 48 | 25.40 | 4.2 | |

The mean age of the patients who have PCOS was 26.46 ± 4.8 years and those who have no PCOS was 25.4 ± 4.2 years. The results showed there was statistically no significant difference in the age between two groups. So the two groups are comparable.

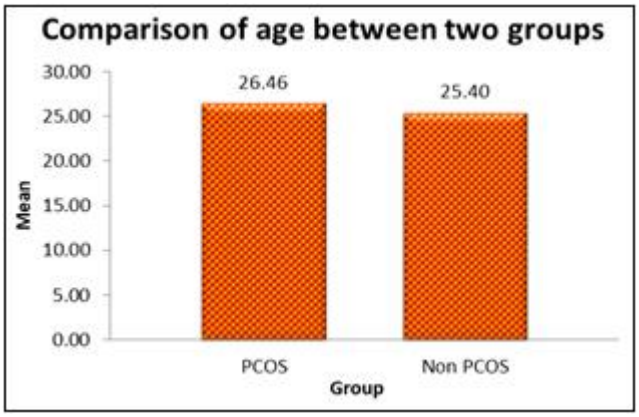


**Figure 1**

**Table 2:** Comparison of Unpredictable Periods between two groups

| Unpredictable Periods | Group | | p value |
|---|---|---|---|
| | PCOS, n=48 (%) | Non PCOS, n=48 (%) | |
| Yes | 36 (75) | 17 (35.4) | <0.001 |
| No | 12 (25) | 31 (64.6) | |

The proportion of patients who have unpredictable periods was higher in PCOS group, 36 (75%) compared to NON PCOS group, 17 (35.4 %), which is statistically significant (p value<0.001).

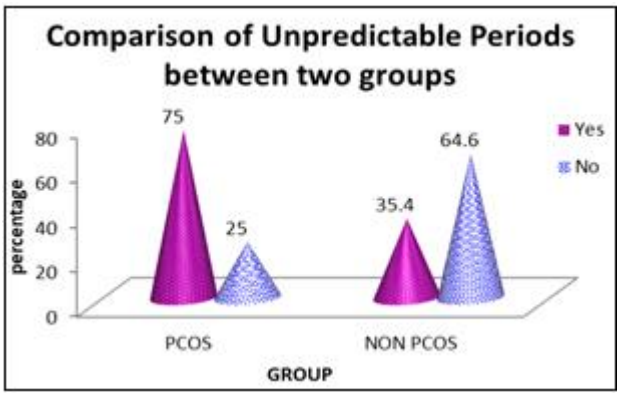


**Figure 2**

**Table 3:** Comparison of length of Menstrual cycle lasting between two groups

| Menstrual cycle lasts longer than 35 days | Group | | p value |
|---|---|---|---|
| | PCOS, n=48 (%) | Non PCOS, n=48 (%) | |
| Yes | 24 (50) | 15 (31.3) | 0.061 |
| No | 24 (50) | 33 (68.8) | |

The proportion of patients whose length of Menstrual cycle lasting longer than 35 days was higher in PCOS group, 24 (50 %) compared to NON PCOS group, 15 (31.3 %), which is statistically borderline significant (p value=0.061).

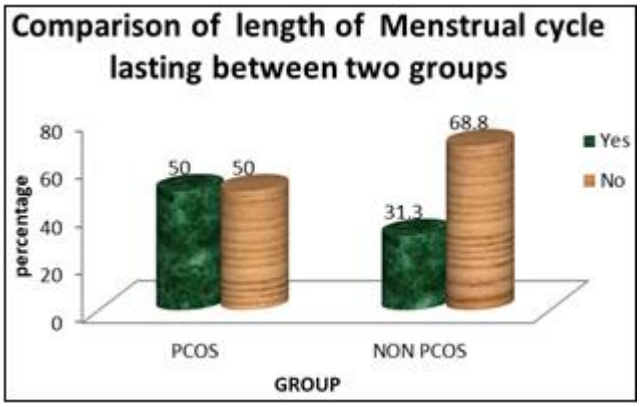


**Figure 3**

**Table 4:** Comparison of Family history of other diseases between two groups

| Family History of Other Diseases | Group | | p value |
|---|---|---|---|
| | PCOS, n=48 (%) | Non PCOS, n=48 (%) | |
| **Yes** | 33 (68.8) | 17 (35.4) | 0.001 |
| **No** | 15 (31.2) | 31 (64.6) | |

Among the patients in the PCOS group 33 (68.8%) had family history of other diseases compared to NON PCOS patients, 17 (35.4%), which is statistically significant (p value=0.001).

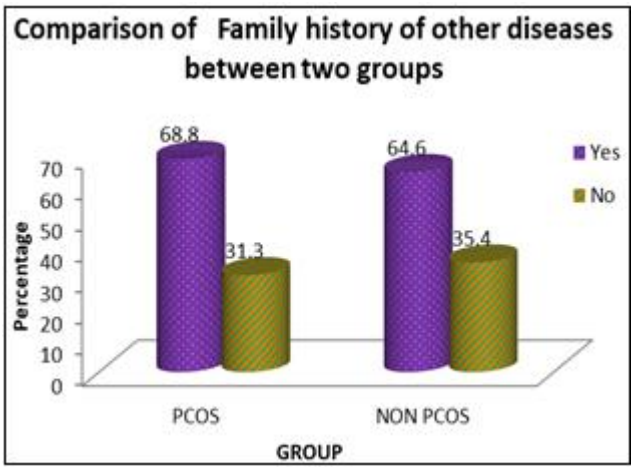


**Figure 4**

**Table 5:** Comparison of Hypoglycaemia between two groups

| Hypoglycaemia | Group | | p value |
|---|---|---|---|
| | PCOS n=48 (%) | Non PCOS n=48 (%) | |
| Yes | 7 (14.6) | 2 (4.2) | 0.08 |
| No | 41 (85.4) | 46 (95.8) | |

Among the patients in the PCOS 7 (14.6%) had hypoglycaemia compared to NON PCOS patients, 2 (4.2%), which is clinically significant but not statistically significant (p value=0.080).

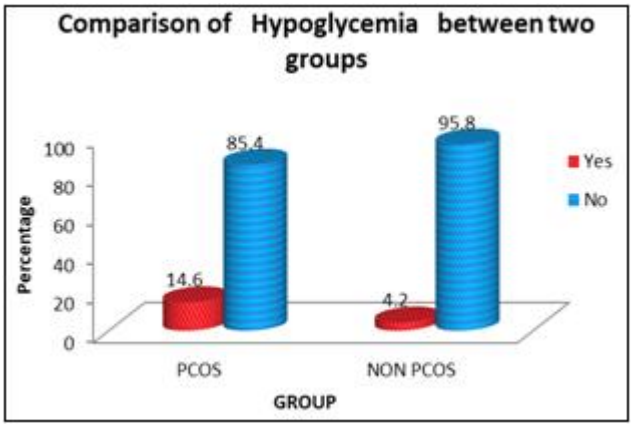


**Figure 5**

**Table 6:** Multivariate analysis

| Variable | B | S. E. | Wald | p value | OR | 95% C. I. for OR | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower | Upper |
| Unpredictable periods | 1.76 | 0.5 | 12.19 | <0.001 | 5.81 | 2.16 | 15.6 |
| Family history of other diseases | 1.54 | 0.5 | 9.39 | 0.002 | 4.66 | 1.74 | 12.47 |
| Hypoglycaemia | 1.78 | 0.94 | 3.6 | 0.058 | 5.95 | 0.94 | 37.57 |
| Menstrual cycle lasts longer than 35days | 0.92 | 0.51 | 3.31 | 0.069 | 2.51 | 0.93 | 6.75 |

The results of the multivariate analysis showed that Unpredictable periods was the most significant factor for PCOS (p value<0.001, Odds Ratio (95% CI) - 5.8 (2.16, 15.6). Family history of other diseases (p value=0.002) and Hypoglycaemia (p value=0.058) were independent factors.

## 4. Discussion

In this study unpredictable periods were the most significant factor for PCOS. Family history of other diseases and Hypoglycaemia were independent factors. A study by Amale P et. al showed that most of the females participated in the survey exhibited symptoms similar to that of the PCOS. The participants of age 12 - 40 years are found to be at a high risk for the occurrence of PCOS, at present or in future. The prevalence of the PCOS is high in 20 - 40 year of age, whereas females during the age more than 40 years may suffer from the CVS and lipid disorder which may be critical in the future if untreated. [1]

In a population study of Andini A D et. al showed that one of the risk factor of polycystic ovary syndrome among asia women are genetics and these factor have role in the pathogenesis of PCOS. [18]A qualitative study of women's experience by T Copp et. al found out that although some women benefit considerably from the diagnosis, such as through increased awareness and reassurance, women with minimal symptoms may experience more harm than benefit, including long lasting anxiety and altered life plans. [12]

In this study it was evident that unpredictable periods are the most significant factor for PCOS as compared to others. And also found that family history of other disease and hypoglycaemia are independent or insignificant factors for PCOS. In mean age comparison showed, there was statistically no significant difference in the age between two groups. So these two groups are comparable.

## 5. Conclusion

The study perceived that the unpredictable periods have an important role in diagnosing PCOS and presence of this factor is an important sign of PCOS. This study also helps in understanding the common factors between PCOS Group and Non PCOS Group. And it also gives an idea about PCOS common symptoms and subjects will be able to take suitable preventive measures before getting worse.

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