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## Prevalence of PCOS Among Adolescent Girls Attending Secondary Care Hospital in Portblair, Andaman & Nicobar Islands

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### Abstract

**Background** - PCOS is the most common endocrinological disorder among women of reproductive age group. There is no complete cure of PCOS but early diagnosis and treatment can control the symptoms, it lowers the risk of infertility, miscarriages, diabetes, hypertension and cardiovascular diseases. The objectives of this study is to find out the prevalence of PCOS among adolescent girls coming to the OBG OPD in a secondary care hospital and to find out the risk factors associated with PCOS.

**Methods** -This cross-sectional study was carried out from March 2019 to June 2019 among 120 adolescent girls aged 15-24 years attending outpatient department of secondary care hospital in Port Blair, Andaman & Nicobar Islands. Convenient sampling technique was used for the selection of samples. The patients attending the outpatient department, who met the inclusion criteria evaluated.

**Results** - A total of 120 girls aged from 13-22 were included in the study with the mean age of  $17.94 \pm 2.578$  with the range of 13 to 22 years According to Rotterdam criteria 44 (36.7%) have oligo/anovulation and 25 (20.8%) have excess androgen activity. 29 (24.2%) have polycystic ovaries. (Figure 1) The overall prevalence of PCOS in the study population according to Rotterdam criteria were 16 (13.3%). BMI  $\geq 25$  (P value  $<0.05$ ) and waist hip ratio  $\geq 0.85$  (P value  $<0.05$ ) were strongly associated with the presence of PCOS.

**Conclusion**- The diagnosis of PCOS always remains a challenge for heal the care providers. The lack of awareness and ignorance to their particular condition always remains high. Life style modification for weight reduction and dietary modification and psychological counselling plays an important role in order to prevent long term complications.

**Keywords:** Adolescents, PCOS, Infertility, Prevalence

### Introduction

PCOS is the most common endocrinological disorder among women of reproductive age group.<sup>1</sup> It is the most common cause of infertility which affects 6-8% of women in reproductive age group.<sup>2</sup> Globally prevalence of PCOS is estimated to be 2.2% as high as 26% this age group depending on the definition.<sup>1</sup> In India the prevalence has been reported as 3.7% to 22.5% in which, adolescent girls account for 36%.<sup>3,4</sup> Adolescent girls during the early stages of puberty tend to have anovulation, abnormal hair growth, obesity and acne.<sup>5</sup> PCOS symptoms tend to overlap with normal pubertal changes, due to these variations there are chances of misdiagnosis in adolescent age group.<sup>6,7</sup>

The characteristics of PCOS includes increased secretion of androgen level (hyperandrogenism) and gonadotropin releasing hormone (GnRH) that leads to menstrual irregularity, hirsutism, and infertility.<sup>8</sup>

Risk factors of PCOS can be mainly divided into hereditary and environmental. The hereditary factors include early age of attaining sexual maturation, family history of PCOS among first degree relatives and women born of small for gestational age. Studies suggest that prevalence of PCOS is twice in SGA women than AGA. Environmental factors include physical inactivity, obesity and its associated insulin resistance, exposure to toxins and stress, unhealthy food habits.<sup>9</sup>

The National Institute for Health (NIH) Criteria 1990 was revised in 2003 and Rotterdam criteria [2] has been adopted world over. The definition of PCOS according to Rotterdam is (1) oligo and/ or anovulation (2) hyperandrogenism (clinical and biochemical) (3) polycystic ovaries identified sonographically the diagnosis largely made by this definition. All the elements of Rotterdam criteria should be met in order to diagnose PCOS.<sup>10</sup> Insulin resistance is another feature of PCOS, those women affected have a higher risk of developing Type II diabetes mellitus. Mostly women are unaware to seek medical treatment until they develop a sequel. There is no complete cure of PCOS but early diagnosis and treatment can control the symptoms, it lowers the risk of infertility, miscarriages, diabetes, hypertension and cardiovascular diseases.<sup>1</sup> Some studies suggest that there is decreased quality of life and depression among PCOS diagnosed women.<sup>11</sup> The purpose of the study is to assess the prevalence and risk factors of PCOS in islanders as they have limited health care facilities and resources. The objectives of this study is to find out the prevalence of PCOS among adolescent girls coming to the OBG OPD in a secondary care hospital and to find out the risk factors associated with PCOS

### Methods

This cross-sectional study was carried out from March 2019 to June 2019 among 120 adolescent girls aged 15-24 years attending outpatient department of secondary care hospital in Portblair, Andaman & Nicobar Islands. Convenient sampling technique was used for the selection of samples. The patients attending the outpatient department, who met the inclusion criteria evaluated.

#### Inclusion criteria

1. Girls aged 15–24 years
2. Girls who had attained menarche more than two years before the study.

#### Exclusion criteria

1. Those who were known cases of thyroid disorders, hyperprolactinemia, congenital adrenal hyperplasia, Cushing's syndrome, tuberculosis and endometriosis
2. Those who were not willing to participate in the study.

### Data collection and procedure

The subjects were interviewed with a pretested interview schedule by principal investigator. The interview schedule was developed through a pilot study. The final interview schedule were developed according to the information gathered. Interview schedule was translated in local languages (Hindi, Tamil and Telugu) and was back translated to check for validity. Questionnaire consists of three parts. First part dealt with demographic characteristics, second part with clinical history, anthropometric assessment and menstrual history. Third part was PCOS assessment and the investigator verified the clinical history, blood reports and USG reports thoroughly. Final diagnosis of PCOS was made by Rotterdam criteria. An informed written consent was obtained prior to conducting the study. In the case of an individual less than 18 years, consent was obtained from the parent/guardian. The study was approved by the Institutional Ethics Committee.

Data was entered in Microsoft Office Excel 2013 and analysed using SPSS software trial version 20.0. Depending on the variable distribution, results were expressed as numbers, percentages, and mean  $\pm$  SD Chi-square test was used to find the association of PCOS with age, BMI and waist hip ratio.  $p < 0.05$  was considered to be statistically significant.

### Results

A total of 120 girls aged from 13-22 were included in the study with the mean age of  $17.94 \pm 2.578$  with the range of 13 to 22 years. More than half of the study participants were unmarried (76.7%). The mean age of menarche were  $12.18 \pm 1.384$ . 41.7% of the study participants have irregular menses.

#### Endocrinological abnormalities

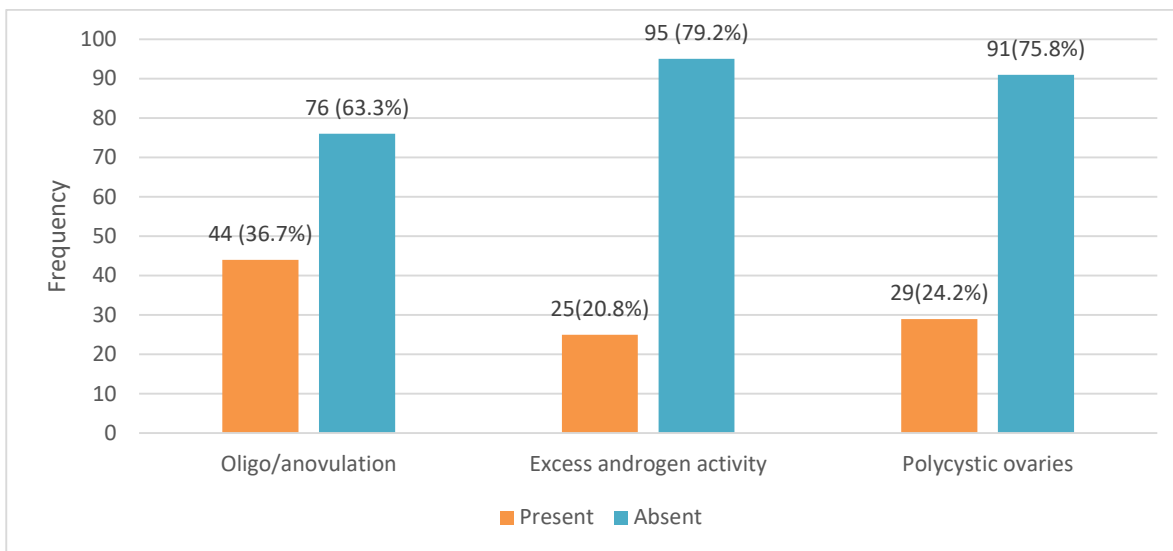
64 (53.3%) girls had oligomenorrhoea and 35 (29.2%) girls had hirsutism. Acne were present in 64 (53.3%) girls and 57 (47.5%) girls had complain of hair fall. Only one fourth of the study participants have polycystic ovaries (24.2%). (Table I)

**Table 1:** Distribution of study population according to endocrinological abnormalities.

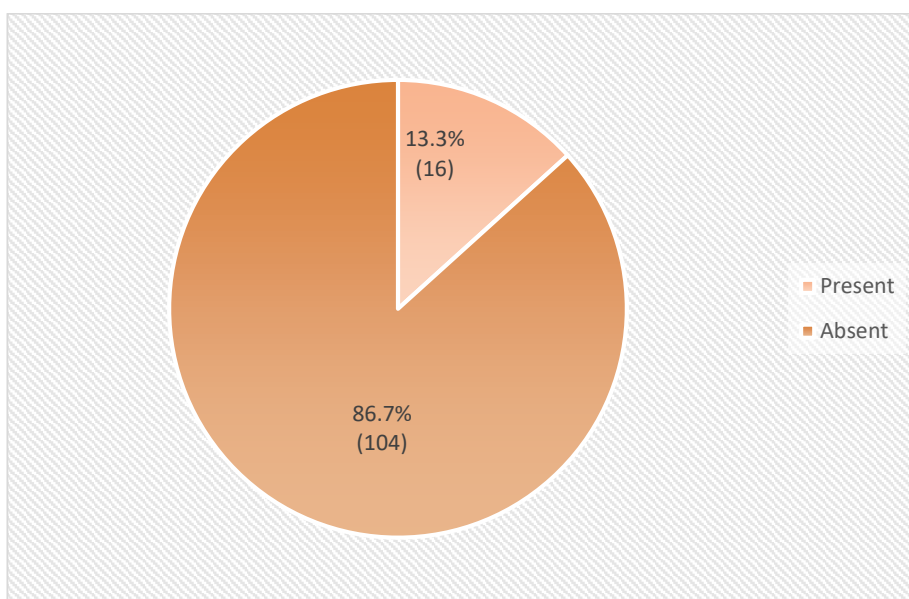
Endocrinological abnormalities	Frequency	Percentage
<b>Oligomenorrhoea</b>		
Present	64	53.3
Absent	56	46.7
<b>Hirsutism</b>		
Present	35	29.2
Absent	85	70.8
<b>Acne</b>		
Present	64	53.3
Absent	56	46.7
<b>Hair fall</b>		
Present	57	47.5
Absent	63	52.5
<b>Polycystic ovaries</b>		
Present	29	24.2
Absent	91	75.8

According to Rotterdam criteria 44 (36.7%) have oligo/anovulation and 25 (20.8%) have excess androgen activity. 29 (24.2%) have polycystic ovaries. (Figure 1) The

overall prevalence of PCOS in the study population according to Rotterdam criteria were 16 (13.3%). (Figure 2)



**Fig. 1:** Distribution of study population according to Rotterdam criteria.



**Fig. 2:** Prevalence of PCOS according to Rotterdam criteria.

Among all the risk factors, BMI  $\geq 25$  (P value  $< 0.05$ ) and waist hip ratio  $\geq 0.85$  (P value  $< 0.05$ ) were strongly associated with the presence of PCOS. (Table 2)

**Table 3:** Association between PCOS and other variables.

Variables	PCOS present n (%)	PCOS absent n (%)	p value
Age (in years)			
<20	9 (10.6%)	76 (89.4%)	0.236
$\geq 20$	7 (20%)	28 (80%)	
BMI			
<25	2 (2.9%)	68 (97.1%)	0.001**
$\geq 25$	14 (28%)	36 (72%)	
Waist hip ratio			
<0.85	2 (4.8%)	40 (95.2%)	0.043*
$\geq 0.85$	14 (17.9%)	64 (82.1%)	

**Discussion**

It is said that one in five Indian women suffer from PCOS. PCOS is not a disease, it is a condition which can be presented in different ways. It's a complex endocrine disorder which can lead to infertility and menstrual problems. Our study is done in young women who is residing at an Island. In our study the prevalence of PCOS

according to Rotterdam criteria is 13.3%. Another study done by N.A Desai they got prevalence of PCOS in adolescents (13.54%) similar to our study.<sup>8</sup> Archana et.al got 11.96% which is closer to our study.<sup>12</sup> Other similar studies done by Swetha Balaji et.al and Beena Joshi et.al got the prevalence as 18% and 22% respectively.<sup>13,2</sup> Our study included 120 girls with mean age of 17.94 and more

than half of the study participants are unmarried which is almost similar to the study done by Swetha Balaji et.al.<sup>13</sup> 41% of our study group showed irregular menses and it varies in different studies. In a study done by N.A Desai in Ahmedabad it shows 71%.<sup>8</sup>

PCOS is an endocrine disorder, the endocrinological abnormalities noted in our study was mainly suggestive androgenic activity like hirsutism, loss of hair, acne and oligomenorrhoea. Around 53.3% participants had oligomenorrhoea and 29.2% had hirsutism. In a study done by Archana Singh it was observed that around 21% had hirsutism.<sup>12</sup> In a study done in Ahmedabad about 25.2% showed hirsutism.<sup>8</sup> In our study it was observed that 53.3% had acne and 47.5% complained of hair loss. Other main feature which is also included is endocrinological abnormalities are presence of polycystic ovaries above with the androgenic activity, around 24.2% had polycystic ovaries.

PCOS in our study was strongly associated with BMI and waist hip ratio. Around 28% who has BMI value greater than 25 had PCOS. Waist hip ratio greater than 0.85, 17.9% had PCOS. In the study done by Gupta they observed that there is strong association of BMI and waist hip ratio.<sup>1</sup> In a study done by Shawna et.al in California also showed that obesity has a significant relation with PCOS.<sup>14</sup> In a study done by Sangitha Sharma showed that there is significant association of BMI and waist hip ratio with PCOS.<sup>15</sup>

### Conclusion

The diagnosis of PCOS always remains a challenge for health care providers. The lack of awareness and ignorance to their particular condition always remains high in our study. As the prevalence of PCOS is in a raising trend it has to be taken seriously and health care workers should give awareness about maintaining optimum BMI and waist hip ratio from adolescent period, life style modification for weight reduction and dietary modification and psychological counselling plays an important role in order to prevent long term complaints.

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### Declarations

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Conflict of interest: None

Ethical approval: The study was approved by the Institutional Ethics Committee

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