

Prevalence of Polycystic Ovary Syndrome and its Associated Risk Factors among Adolescent and Young Girls in Guntur Region

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Abstract.

The current study was out to ascertain the frequency, etiology, and correlation between PCOS and other variables in school-age females in the Guntur area. Research design: Five schools in the Guntur, region were chosen using cluster sampling, and the school-going girls there participated in a cross-sectional community-based study. 881 school-age girls, ranging in age from 13 to 18, participated in the study. Rotterdam criteria were used to diagnose PCOS. Insulin, testosterone, and LH levels were estimated. The quality of life was assessed using the SF-12 questionnaire. Data analysis was done with the SPSS 9.0 PC application. Rotterdam criteria. Girls with PCOS make up a larger percentage of the upper socioeconomic class (45.37). The largest percentage of PCOS girls (37-81) had a family history of diabetes mellitus. A substantial connection ($p \leq 0.05$) was observed between PCOS girls and lifestyle variables. In PCOS girls, testosterone and LH levels were found to be statistically significant. Compared to typical girls, a greater proportion of girls have poor quality lives. In conclusion, the risk factors linked to PCOS include obesity, socioeconomic status, familial history, and insulin resistance. Among PCOS symptoms, hirsutism, acne, dysmenorrhea, and oligomenorrhea were the most often reported.

Keywords: Body Mass Index, Hirsutism, Hyper androgenesim, PolycysticOvarian Syndrome (PCOS), Rottedram criteria.

1. Introduction

Polycystic Ovary Syndrome (PCOS), a common endocrine disorder, affects people assigned female at birth and is characterized by a combination of hormonal imbalances and reproductive issues. PCOS is estimated to affect up to 10% of individuals of reproductive age, making it one of the most prevalent hormonal disorders in this demographic.

The syndrome's name is derived from the appearance of the ovaries in affected individuals, where small, fluid-filled sacs called cysts can form on the ovaries. These cysts, however, are not the cause of the condition but rather a symptom of the hormonal imbalances at play.

PCOS is often associated with elevated levels of androgens, the male hormones, which can lead to a range of symptoms. These symptoms include irregular menstrual cycles, anovulation (lack of ovulation), infertility, acne, excessive hair growth (hirsutism), and metabolic issues such as insulin resistance, which may contribute to weight gain.

The exact cause of PCOS is not fully understood, but it is believed to involve a combination of genetic and environmental factors. While there is no cure for PCOS, its symptoms can be managed through lifestyle changes, medication, and sometimes assisted reproductive technologies for those experiencing fertility challenges.

Understanding and addressing PCOS is crucial not only for managing its symptoms but also for preventing long-term complications, such as type 2 diabetes, cardiovascular disease, and endometrial cancer. Increased awareness, early diagnosis, and a multidisciplinary approach involving healthcare professionals from various fields are essential for effectively managing PCOS and improving the quality of life for those affected. Amenorrhea is the maximum collective problem of PCOS in adolescent girls (1935 by Stein and Leventhal).

2. Design/Methods/Modelling

In order to ascertain the prevalence and early diagnosis of PCOS in 963 adolescent girls chosen from five urban and rural schools in Guntur, Andhra Pradesh, this study is cross-sectional, multicentric, and prospective. Data gathering took place between September 2020 and April 2021. The study included school-age girls between the ages of 13 and 18 who met the eligibility criteria. Additionally, subjects without a history of hypolactatemia, congenital adrenal hyperplasia, thyroid disease, or any other cause of amenorrhea, Cushing syndrome, androgen-secreting neoplasm, tuberculosis, or endometritis were chosen.

Using a variety of statistical criteria, including mean, standard deviation, percentage, correlation coefficient, and chi square test method, analysis was conducted following data collection. $P \leq 0.05$ and $P \leq 0.10$ were the thresholds for statistical significance for both of the hypothesis tests.

Data analysis was done on a PC with the SPSS 9.0 program.

3. Results and Discussion

Out of the 881 girls who underwent screening, 119 (13.54%) had PCOS, as determined by the Rotterdam criteria. The age range of 17 years old (30.25%) had the highest prevalence of PCOS, while the mean age of PCOS girls was 15.73 ± 1.28 (Table 1).

Table 1: Distribution according to Age of school going girls of PCOS and non PCOS.

Age	Non PCOS		PCOS	
	Total Number N = 762	%	Total Number N= 119	%
13	55	6.24	7	5.88
14	195	22.13	17	14.28
15	225	25.53	20	16.80
16	165	18.72	34	28.57
17	96	10.89	36	30.25
18	26	2.95	5	4.20

The PCOS girls had a mean age of 12.36 ± 2.75 for their first menarche, and they had a greater prevalence of menstrual irregularity (29.41%) compared to non-PCOS girls (12.59%). This demonstrates a strong link between PCOS and irregular menstruation. Compared to non-PCOS girls, the frequency of PCOS girls was greater for both excessive and severe hirsutism (25.21%) and hirsutism (47.05%) (Figure 1). Consequently, a strong link between hirsutism and PCOS was discovered.

Table 2: Age wise prevalence of menstrual complications in PCOS girls.

Menstrual Complications	Age	Age	Age	Age	Age	Age
	13 (%))	14 (%))	15 (%))	16 (%))	17 (%))	18 (%))
Dysmenorrhea	28.5 7	41.1 7	90	64.7	69.44	10 0
Amenorrhea	14.2 8	0	0	8.82	2.77	0
Menorrhagia	28.5 7	35.2 9	30	29.41	13.88	20
Metrorrhagia	0	23.5 2	35	20.58	13.88	0
Hypomenorrhea	0	0	25	8.82	13.88	0

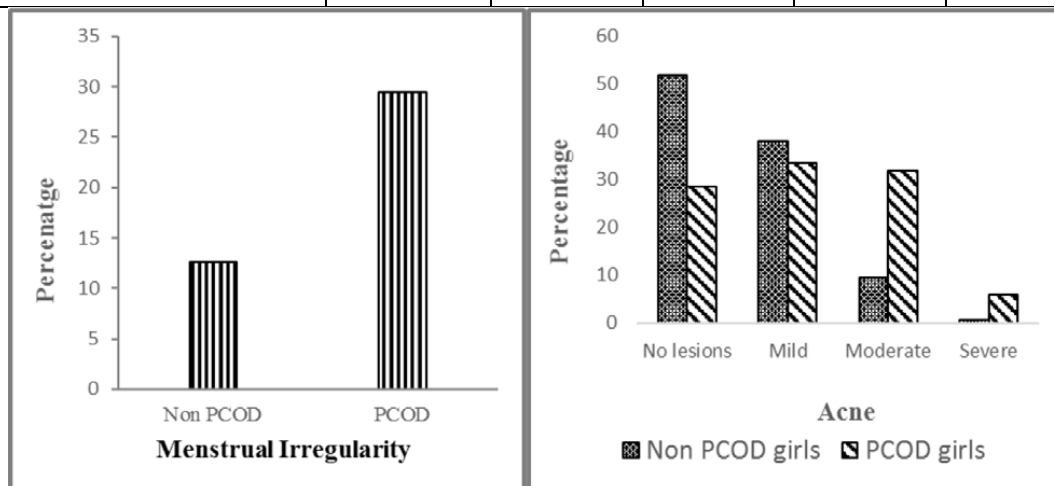


Fig – 1: Occurrence of irregular menstrual cycle and Acne in PCOS and non PCOS.

According to the findings, girls with PCOS had greater rates of moderate (31.93%) and severe (5.88%) acne than girls without PCOS (9.44% and 0.65%, respectively). Severe acne in PCOS females at the age of 14 (11.76%). In PCOS girls, the age groups with the highest prevalence of mild and moderate acne were 17 (41.66%) and 18 (60%) respectively.

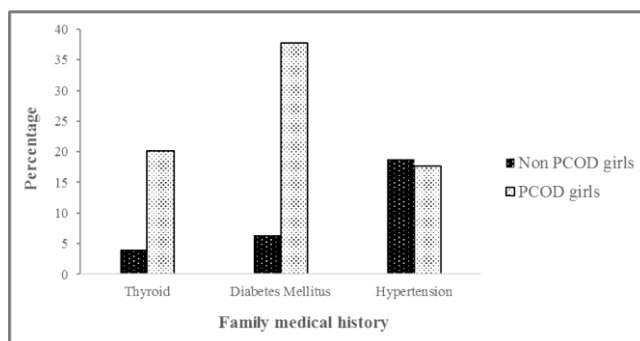


Fig –2: Family medical history of non PCOS and PCOS girls.

It was discovered that PCOS girls were more likely to be overweight (60%) and obese (20.58%) at age 18. Among PCOS girls, the highest percentage had a family history of hypertension (17.64%), thyroid (20.16%), and diabetes mellitus (37.81%), compared to 4.06%, 6.43%, and 18.76% for normal girls. Hence, PCOS and non-PCOS girls differed statistically in their family histories of thyroid and diabetes mellitus, although (Figure 2)

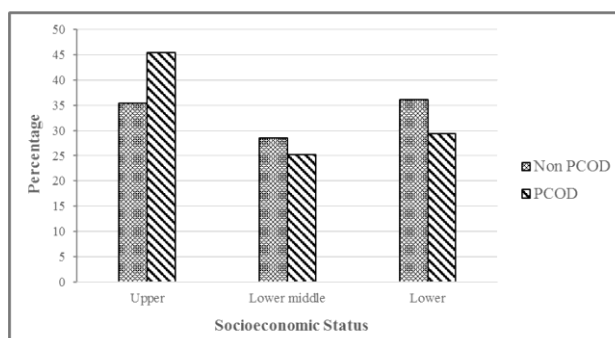


Fig –3: socioeconomic status and PCOS in girls

Based on the socioeconomic status, it was found that higher percentage of PCOS girls belong to upper socioeconomic class (45.37%) as compared to non PCOS girls (35.43%). Hence, upper class girls are more prevalent to PCOS than other class (Figure 3).

Table 4: Association of PCOS with life style factors in girls diagnosed with PCOS.

Daily activities	Non PCOS (%)	PCOS (%)
Participates in sports		
Yes	67.97	38.65

No	32.02	61.3 4*
	Physical exercise	
Yes	29.92	33.6 1
No	70.07	66.3 8
Sleeping habits in afternoon		
Yes	40.68	59.6 6
No	59.31	40.3 3
	Diet Habit	
Vegetarian	91.07	94.9 5
Non vegetarian	6.03	4.2
Eggeterian	2.88	0.84
	Taking junk food	
Everyday	6.29	10.9 2
Once in week	29.52	30.2 5
Twice in month	27.82	23.5 2
Once in month	26.64	27.7 3
Not at all	9.71	7.56

Compared to girls without PCOS, a greater proportion of PCOS girls did not exercise or play sports, which could contribute to obesity and other issues in PCOS girls (Table 4).

According to the SF12 health survey, a greater proportion of girls than typical girls experience health issues in general, have less energy, and feel depressed and blue, calm and peaceful, or have trouble climbing stairs when engaging in moderate activities like moving tables, pushing vacuum cleaners, bowling, or playing golf (Table 5).

Table 5: Comparison of HealthRelated Quality of Life in girls diagnosed with PCOS.

Adolescents frequently experienced menstrual difficulties, which caused worry for both the patients and their families. The prevalence rates of menorrhagia, metrorrhagia, oligomenorrhea, and dysmenorrhea in PCOS girls were significantly different from those in the normal group in our study, which is consistent with other studies that have been published.^{5, 10} Similar to adults, the growth in obesity during the past few decades has correlated with the rising prevalence of PCOS in children and adolescents. Eleven In line with earlier study reports, PCOS girls had a greater prevalence of overweight and obesity than non-PCOS girls. Therefore, there was a strong link between PCOS and obesity.

A greater correlation was found between hypothyroidism and a family history of diabetes mellitus and PCOS. Similar outcomes were found in this investigation. However, there was no statistically significant difference in the family history of hypertension compared to the normal population, which was also supported by other published investigations.

According to earlier research, there is a 2.7-fold increased likelihood of a metabolic illness in PCOS patient families compared to control group families.¹⁴ Therefore, compared to females from normal-parent households, PCOS is more common in those whose parents and grandparents had metabolic abnormalities. According to earlier research, women with PCOS have a three times higher prevalence of hypertension than those without the condition.¹⁵ The findings of our investigation, which were nearly identical to those of other published studies, indicated that obese PCOS girls had higher blood pressure than non-obesity PCOS girls.¹⁵ Therefore, there was a clear correlation between obesity and PCOS and higher blood pressure.

The relationship between PCOS and socioeconomic status (SES) may provide insight into how the environment contributes to PCOS development. According to prior research, people

with higher socioeconomic status (SES) were more likely to acquire obesity and insulin resistance, which were strongly connected with the pathophysiology of PCOS. Our study found a similar relationship between upper SES and PCOS.

We also examined the daily activities, eating patterns, and unhealthy behaviors of girls in this study. Regarding unhealthy habits and food, there was no discernible difference; nevertheless, there was a strong correlation found between PCOS and physical activity, with the latter being higher in PCOS patients than in the general population. The dietary and lifestyle habits of individuals with PCOS have been the subject of few research, which have demonstrated that proper lifestyle adjustments and increased physical activity are thought to be the first line treatments for PCOS patients.

4. Conclusions

In summary, the current research indicates that PCOS is a newly recognized illness linked to a variety of health issues, including irregular menstruation, hirsutism, and acne—all of which are prevalent endocrine problems that affect adolescent females. Diabetes and hypothyroidism in the family were significant risk factors linked to PCOS. Health care professionals and teenage girls need to be more aware of early PCOS diagnosis and interventions as they may offer the chance to treat the condition and avert further complications. Girls who are overweight or obese should receive special attention because they have a higher risk of PCOS, which can be treated with a change in lifestyle. As a result, early intervention to avoid or lessen the impact of cutaneous and reproductive symptoms as well as the long-term implications of metabolic changes is made possible by the early recognition of the condition based on clinical signs (primarily oligo- or amenorrhea) (Franks, 2008).

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References

1. Arora B, Arora V, Patel S. Polycystic Ovarian Syndrome: An awareness guide for women. *Journal of Pharmacy Research*. 2014;8(7):884-92.
2. Asgharnia M, Mirblook F, Soltani MA. The Prevalence of Polycystic Ovary Syndrome (PCOS) in High School Students in Rasht in 2009 According to NIH Criteria
3. Asunción M, Calvo RM, San MJL, Sancho J, Avila S, Escobar-Morreale HF. A prospective study of the prevalence of the polycystic ovary syndrome in unselected Caucasian women from Spain. *J Clin Endocrinol Metab*. 2000;85(7):2434-8.
4. Azziz R, Carmina E, Dewailly D, Diamanti-Kandarakis E, Escobar-Morreale HF, Futterweit W, et al. Positions statement: criteria for defining polycystic ovary syndrome as a predominantly hyperandrogenic syndrome: an Androgen Excess Society guideline. *J Clin Endocrinol Metab*. 2006;91(11):4237-45.
5. Diamanti-Kandarakis E, Kouli CR, Bergiele AT, Filandra FA, Tsianateli TC, Spina GG, et al. A Survey of the Polycystic Ovary Syndrome in the Greek Island of Lesbos: Hormonal and Metabolic Profile. *The Journal of Clinical Endocrinology and Metabolism*. 1999;84(11):4006-11. I
6. Franks. "Polycystic ovary syndrome in adolescents". *International Journal of Obesity*. 2008;32 -7:1035-41. *international Journal of Fertility and Sterility*. 2011;4(4):156-9.
7. Ehrmann DA. Polycystic Ovary Syndrome. *New England Journal of Medicine*. 2005;352(12):1223-36.
8. Nidhi , Padmalatha V, Nagarathna R, R. "Prevalence of Polycystic Ovarian Syndrome in Indian Adolescents". *Journal of Pediatric and Adolescent - Gynecology*. 2011;24(4):223-7.
9. Van HMH, Voorhorst FJ, Kaptein MB, Hirasing RA, Koppelaar C, Schoemaker J. Endocrine features of polycystic ovary syndrome in a random population sample of 14-16 year old adolescents. *Hum Reprod*. 1999;14(9):2223-9.