DOI: https://doi.org/10.53350/pjmhs2023172512

ORIGINAL ARTICLE

Frequency of Polycystic Ovary Disease in Adolescent

NAZISH GUL[1], NAJMA BIBI[2], MARIA GHAFOOR[2], RUBINA BABAR[2], FAUZIA ANBREEN[3]
[1]*Trainee Medical Officer, Obstetrics and Gynecology Department, Women and Children Hospital Dera Ismail Khan*
[2]*Assistant Professor, Obstetrics and Gynecology Department, Gomal Medical College, Dera Ismail Khan*
[3]*Professor, Obstetrics and Gynecology Department, Gomal Medical College, Dera Ismail Khan*
Corresponding author: Najma Bibi, Email: doctornajmafarhat@gmail.com

ABSTRACT

Introduction: Polycystic ovary syndrome (PCOS) is the most common cause of chronic hyper androgenic anovulation and the single most common cause of infertility in young women. Anovulatory cycles are frequent in adolescents. The common signs of adult hyperandrogenism are less reliable in adolescents than in adults: hirsutism is in a developmental phase, and acne vulgaris is common.

Objective: To determine the frequency of polycystic ovary disease in adolescent presented to outdoor.

Study Design and Setting: This cross sectional study was carried out in the Department of Obstetrics & Gynecology, DHQ, Zanana Hospital, Dera Ismail Khan.

Duration of Study: This study was conducted from 1st July 2019 to 31st December 2019.

Subjects and methods: A total of 128 girls presenting to OPD due to irregular periods were included. Ultrasound was done to all participants under supervision of consultant gynecologist of 3 years post fellow ship experience. 5 ml venous blood samples was collected from all participants by a 3rd year resident and was subsequently sent to laboratory for androgen levels. Polycystic ovary disease as per operational definition was noted.

Results: Age range in this study was from 14 to 20 years with mean age of 18.195±1.29 years, mean weight 52.898±4.92 Kg, mean height 1.571±0.08 meters and mean BMI was 21.557±2.80 Kg/m^2. 19.5% patients were with family history of polycystic ovary disease. Polycystic ovary disease was seen in 7.8% patients.

Practical implication: To determine the frequency of polycystric ovary disease in adolescent presented to outdoor.

Conclusion: Polycystic ovarian syndrome is affecting the lives of young unmarried girls. The clinical manifestations are variable with obesity playing the key role.

Keywords: Adolescent, Irregular period, Polycystic ovary syndrome, Frequency

INTRODUCTION

Polycystic ovary syndrome (PCOS) is the most common cause of chronic hyper androgenic anovulation and the single most common cause of infertility in young women[1]. It is also a risk factor for metabolic syndrome-related comorbidities and for impaired wellbeing and mortality[2]. Considerable evidence suggests that PCOS has diverse causes, arising as a complex trait with contributions from both heritable and environmental factors that affect ovarian steroidogenesis[3,4]. Insulin resistant hyperinsulinism, in part related to coexistent obesity, is the most common non steroidogenic factor. The complex interactions generally mimic an autosomal dominant trait with variable penetrance: the disorder is correlated in identical twins; about half of sisters are hyper androgenic, and half of these also have oligo-amenorrhea and thus PCOS; and polycystic ovaries appear to be inherited as an autosomal dominant trait. Three percent to 35% of mothers have PCOS[,5] and metabolic syndrome prevalence is high in parents and siblings. The syndrome was first described by Stein and Leventhal[6]. Over the past 25 years, internationally accepted diagnostic criteria have been developed for adults based on various combinations of otherwise unexplained hyperandrogenism, anovulation, and a polycystic ovary, which are all encompassed by Rotterdam consensus criteria.

Anovulatory cycles are frequent in adolescents. The common signs of adult hyperandrogenism are less reliable in adolescents than in adults: hirsutism is in a developmental phase, and acne vulgaris is common. Testosterone serum levels rise during anovulatory cycles; there is a paucity of reliable norms for androgen levels in adolescent girls, and the extent to which adolescent hyperandrogenism predicts adult hyperandrogenism is unclear. Furthermore, polycystic ovary morphology by adult standards is common in normal adolescents. Recent Endocrine Society clinical guidelines suggest that adolescent PCOS be diagnosed using the National Institutes of Health–based criteria of otherwise unexplained hyperandrogenism and persistent anovulatory menstrual abnormality[7].

In a study by Christensen SB, et al. has showed that frequency of polycystic ovary disease was 0.56% in adolescent[8].

Nidhi R, et al. has showed in another study that frequency of polycystic ovary disease was 9.13% in adolescent[9].

Polycystic ovary disease was diagnosed if any two of following conditions present.

- Oligoovulation (cycles of ≥36 days or <8 cycles a year) on history
- Excess androgen levels (Testosterone (free) 0.06 to 2.57 pg per measured by laboratory test
- Polycystic ovaries (Polycystic ovaries was defined by the ultrasound appearance of 12 or more follicles in each ovary measuring 2 to 9 mm in diameter and ovarian volume >10cm3).

Objective: To determine the frequency of polycystic ovary disease in adolescent presented to outdoor.

Study design: Cross Sectional Study.

Setting: This study was carried out in the Department of Obstetrics & Gynecology, DHQ, Zanana Hospital, Dera Ismail Khan.

Duration of study: This study was conducted from 1st July 2019 to 31st December 2019.

Sample size: Sample size was calculated by using following formula:

n= z2 pq/d2

Expected proportion (polycystic ovary disease) = 9.13%[9].

and q= 1-p and d= 5% with 95% Confidence level

n= 128

Sampling technique: Non-probability consecutive sampling.

Inclusion Criteria:

- Girls of age 14-20 years presenting to OPD due to irregular periods (a menstrual flow of fewer than two days or more than seven days)
- Not having consumed any medications, except for anti-allergy medicines and sedatives, for at least 3 months on history.

Exclusion Criteria:

- H/o adrenal, thyroid, hyperprolactinemia disorders on medical record
- H/o thalassemia on medical record
- H/o endocrinopathy such as Cushing syndrome on medical record

Patients fulfilling the inclusion criteria from outdoor department of Obstetrics & Gynecology, DHQ, Zanana Hospital, Dera Ismail Khan were included in the study after permission from ethical committee and research department of institution. A detailed explanation about the participation in the study was given to the

patient or parents/legal guardian and a written informed consent was obtained explaining the benefits of the study. Basic demographics like age, family history of polycystic ovary disease and weight (on weighing machine) were recorded.

Ultrasound was done to all participants under supervision of consultant gynecologist. 5 ml venous blood samples was collected from all participants and was subsequently sent to laboratory for androgen levels.

Data Analysis: Data was analyzed with statistical analysis program (IBM-SPSS-version:22). Mean ±SD was presented for quantitative variables like age, weight, height and BMI. Frequency and percentage was computed for qualitative variables like family history of polycystic ovary disease and polycystic ovary disease. Effect modifiers like age, family history of polycystic ovary disease and BMI were controlled by stratification. Post stratification chi square test was applied, p ≤0.05 was considered statistically significant.

RESULTS

Age range in this study was from 14 to 20 years with mean age of 18.195±1.29 years, mean weight 52.898±4.92 Kg, mean height 1.571±0.08 meters and mean BMI was 21.557±2.80 Kg/m2 as shown in Table-I.

19.5% patients were with family history of polycystic ovary disease as shown in Table-II.

Polycystic ovary disease was seen in 7.8% patients as shown in Table-III.

Table-1: Mean±SD of patients according to age, weight, height and BMI

Demographics	Mean±SD
Age (years)	18.195±1.29
Weight (Kg)	52.898±4.92
Height (m)	1.571±0.08
BMI (Kg/m2)	21.557±2.80

Table-2: Percentage and Frequency of patients according to family history of polycystic ovary disease

Family history of polycystic ovary disease	No of Patients	%age
Yes	25	19.5%
No	103	80.5%
Total	128	100%

Table-3: Percentage and Frequency of patients according to polycystic ovary disease

Polycystic ovary disease	No of Patients	%age
Yes	10	7.8%
No	118	92.2%
Total	128	100%

Table-4: Stratification of polycystic ovary disease with respect to age.

Age (years)	Polycystic ovary disease		p-value
	Yes	No	0.107
14-17	4(15.4%)	22(84.6%)	
18-20	6(5.9%)	96(94.1%)	
Total	10(7.8%)	118(92.2%)	

Table-5: Stratification of polycystic ovary disease with respect to family history of polycystic ovary disease

Family history of polycystic ovary disease	Polycystic ovary disease		p-value
	Yes	No	0.000
Yes	9(36%)	16(64%)	
No	1(1%)	102(99%)	
Total	10(7.8%)	118(92.2%)	

Table-6: Stratification of polycystic ovary disease with respect to BMI

BMI (Kg/m^2)	Polycystic ovary disease		p-value
	Yes	No	0.048
≤20	6(14.6%)	35(85.4%)	
>20	4(4.6%)	83(95.4%)	
Total	10(7.8%)	118(92.2%)	

Stratification of polycystic ovary disease with respect to age, family history of polycystic ovary disease and BMI are shown in Table-IV, V and VI respectively.

DISCUSSION

This study has shown 7.8% prevalence of PCOS according to Rotterdam criteria in girls between 14 to 20 years of age. Other studies on Asian population have reported lower prevalence rates: 6.3% in Sri Lankan population[10] and 2.4% in Chinese population[11]. This higher prevalence in Pakistan as compared to other Asian countries could be expected because we know the strong etiological link between PCOS and diabetes, and Pakistan has the high prevalence of diabetes. The prevalence of 7.8% reported in our study is close to that reported by March et al in an Australian population which showed a prevalence of 11.9%,[12] although there are small differences in the diagnostic criteria used in the two studies. Their inclusion for clinical examination was based on menstrual irregularity and/or self-reported hirsutism of mF-G score ≥8. They defined menstrual irregularity as a cycle length of ≤21 days or ≥35 days, or ≥ a 4-day variation. While in our study the inclusion was based on a menstrual flow of fewer than two days or more than seven days. All of these girls were invited for pelvic ultrasound. Pakistan being the epicenter of diabetes, it is important to diagnose young females for possible metabolic disorders. Studies show that Asian patients with PCOS have higher fasting insulin levels and greater IR compared to British and Australian white women with PCOS[13,14]. We now know that glucose intolerance and diabetes is common in young and asymptomatic PCOS females and especially in Asian populations[15]. Early recognition and treatment can avoid the long-term health risks.

In comparison with other studies that have used Rotterdam criteria, among 42 confirmed PCOS in our study, the prevalence of oligo/amenorrhea observed (97.62%) was similar to that found in the Sri Lankan population (95.1%) but much higher compared to that found in South Australian population (23.8%). This points to a higher prevalence of oligo/amenorrhea in the Asian scenario. The age groups studied in Chinese (20-45 years), South Australian (27-34 years), and Sri Lankan (15-39 years) populations had a wide age range whereas our study was restricted to adolescents with a narrow age range of 15-18 years. The lowest age limit for inclusion has been recognized as 14 years, since the mean age of menarche reported among Asian girls is 13.34 years (standard deviation 1.26) [16] and 1.5 years after menarche is required to exclude the period of menstrual irregularity that usually follows menarche[17].

CONCLUSION

Polycystic ovarian syndrome is affecting the lives of young unmarried girls. The clinical manifestations are variable with obesity playing the key role.

REFERENCES

1. Rosenfield RL. The polycystic ovary morphology-polycystic ovary syndrome spectrum. J Pediatr Adolesc Gynecol. 2015;28(6):412–9.
2. Hart R, Doherty DA. The potential implications of a PCOS diagnosis on a woman's long-term health using data linkage. J Clin Endocrinol Metab. 2015;100(3):911–9.
3. Rosenfield RL, Cooke DW, Radovick S. Puberty and its disorders in the female. In: Sperling M, editor. Pediatric Endocrinology. 4th ed. Philadelphia, PA: Elsevier; 2014.p. 569–663.
4. Witchel SF, Oberfield S, Rosenfield RL. The diagnosis of polycystic ovary syndrome during adolescence. Horm Res Paediatr. 2015;83(6):376–89.
5. Sam S, Legro RS, Essah PA, Apridonidze T, Dunaif A. Evidence for metabolic and reproductive phenotypes in mothers of women with polycystic ovary syndrome. Proc Natl Acad Sci USA. 2006;103(18):7030–5.
6. Stein IF, Leventhal ML. Amenorrhea associated with bilateral polycystic ovaries. Am J Obstet Gynecol. 1935;29:181–91
7. Legro RS, Arslanian SA, Ehrmann DA. Diagnosis and treatment of polycystic ovary syndrome: an endocrine society clinical practice guideline. J Clin Endocrinol Metab. 2013;98(12):4565–92.

8. Christensen SB, Black MH, Smith N. The prevalence of polycystic ovary syndrome in adolescents. Fertil Steril. 2013;100(2):10.
9. Nidhi R, Padmalatha V, Nagarathna R, Amritanshu R. Prevalence of polycystic ovarian syndrome in Indian adolescents. J Pediatr Adolesc Gynecol. 2011;24(4):223-7.
10. Kumarapeli V, Seneviratne RD, Wijeyaratne CN, et al: A simple screening approach for assessing community prevalence and phenotype of polycystic ovary syndrome in a semi-urban population in Sri Lanka. Am J Epidemiol 2008; 168:321
11. Chen X, Yang D, Mo Y, et al: Prevalence of polycystic ovary syndrome in unselected women from southern China. Eur J Obstet Gynecol Reprod Biol 2008; 139:59.
12. March AW, Moore VM, Willson KJ, et al: The prevalence of polycystic ovary syndrome in a community sample assessed under contrasting diagnostic criteria. Hum Reprod 2009; 25:544.
13. Norman RJ, Mahabeer S, Masters S: Ethnic differences in insulin and glucose response to glucose between white and Indian women with polycystic ovary syndrome. Fertil Steril 1995; 63:58
14. Wijeyaratne CN, Balen AH, Barth JH, et al: Clinical manifestations and insulin resistance (IR) in polycystic ovary syndrome (PCOS) among South Asians and Caucasians: is there a difference? Clin Endocrinol (Oxf) 2002; 57:343.
15. Weerakiet S, Srisombut C, Bunnag P, et al: Prevalence of type 2 diabetes mellitus and impaired glucose tolerance in Asian women with polycystic ovary syndrome. Int J Gynecol Obstet 2001;
16. Acharya A, Reddaiah VP, Baridalyne N: Nutritional status and menarche in adolescent girls in an urban resettlement colony of south Delhi. Indian J Community Med 2006; 31:10
17. Chang RJ, Katz SE: Diagnosis of polycystic ovary syndrome. Endocrinol Metab Clin North Am 1999; 28:3