

## Management of Adolescent PCOD: A Real Challenge

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### Abstract

**Background:** Polycystic Ovary Syndrome (PCOS) is a common hormonal disorder affecting 5-10% of women worldwide, characterized by irregular menstrual cycles and cysts on the ovaries. Its exact cause is unknown, but early identification and intervention can reduce the risk of complications like diabetes and heart disease. PCOS manifests in various ways, impacting reproductive, cosmetic, metabolic, and psychological aspects. Prevalence is higher in certain ethnic groups, and diagnosis can occur in adolescence but is often delayed. Despite its global impact, most studies focus on developed countries. **Aim of the study:** The study aims to explore the diagnosis and treatment procedures for managing adolescent PCOD in Bangladesh. **Methods:** This study, conducted at the Holly lab hospital & Missionary Hospital Brahmanbaria, Bangladesh. The study spanned one year from January 2023 to December 2023. Diagnosis relied on clinical and biochemical evidence of hyperandrogenism and persistent menstrual irregularities. A one-on-one interview gathered comprehensive medical information. Inclusion criteria covered females aged 10 to 19, while exclusions involved specific medical conditions and ongoing treatments. Statistical analyses using SPSS included expressing variables and logistic regression to identify metabolic syndrome risk factors. The significance level was set at  $p \leq 0.05$  for statistical relevance. **Result:** The study involves 107 adolescent participants with Polycystic Ovary Syndrome (PCOD). Most were aged 10-15 (55.14%) with an average age of 16.8. BMI analysis showed high prevalence of overweight (29.70%) and obesity (39.40%). Abdominal obesity was normal in 76.60%, while 20.00% were pre-hypertensive, and 3.40% had hypertension. Glycemic status varied, with 76.00% normoglycemic, 21.10% prediabetic, and 2.90% diabetic. Dyslipidemia was present in 90.90%, and metabolic syndrome in 42.30%. Biochemical hyperandrogenism was observed in 33.70%. PCOD features included hirsutism (94.90%) and menstrual irregularities (oligomenorrhea 87.85%). Ovarian morphology showed diverse patterns. Hyperandrogenism, ovulatory dysfunction, ovarian morphology, and metabolic factors were primary contributors to PCOD diagnosis. Treatment approaches varied, including classical interventions (34.58%), lifestyle changes (14.95%), combined oral contraception (12.15%), and antiandrogens (7.48%). Therapeutic treatments included N-acetylcysteine, Inositol, Vitamin D supplementation, and Chromium supplementation. **Conclusion:** Managing adolescent Polycystic Ovary Syndrome (PCOS) is challenging due to the high prevalence of metabolic complications. Diagnostic complexity emphasizes careful evaluation to prevent premature labelling and psychological stress. Treatment involves lifestyle interventions, hormonal contraceptives, and anti-androgen medications. Standardized diagnostic criteria and a multidisciplinary approach are crucial. Early intervention and continuous monitoring are essential for mitigating long-term health risks. Further research on PCOS in diverse populations is recommended for tailored interventions and a nuanced understanding.

**Keywords:** Management, Adolescent, PCOD, Challenge, Diagnosis and Treatment.

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## INTRODUCTION

Polycystic Ovary Syndrome (PCOS) is a hormonal disorder that occurs during the reproductive years, resulting in irregular or absent menstrual periods and increased levels of the androgen hormone [1]. In PCOS, numerous tiny fluid-filled sacs, called cysts,

develop along the outer edge of the ovaries, containing immature eggs (follicles) that do not consistently release [2]. The exact cause of PCOS remains unknown [3]. Early identification, intervention, and weight management can mitigate the risk of enduring complications such as type 2 diabetes and heart disease

[4]. Polycystic ovary disease (PCOD) stands out as the most prevalent endocrine disorder among women of reproductive age, affecting approximately 5% to 10% of women in the Western world [5, 6]. Although PCOS can impact women at any stage of their reproductive age, its manifestations may appear in adolescence but may not be diagnosed until well into adulthood [7]. Globally, polycystic ovary syndrome (PCOS) is a prevalent condition in women of reproductive age and likely the most common endocrinopathy in this age group [5]. Based on the diagnostic criteria of the National Institutes of Health (NIH), Rotterdam, and the Androgen Excess and PCOS Society, the reported overall prevalence of PCOS is 6%, 10%, and 10%, respectively [6]. Additionally, a significant majority of affected women (up to 70%) remain undiagnosed [7]. The Rotterdam criteria are widely employed to define PCOS and include the presence of two of three of the following: oligo/anovulation, polycystic ovaries, and clinical or biochemical hyperandrogenism [8]. Women with PCOS exhibit diverse clinical features, encompassing reproductive, cosmetic, metabolic, and psychological aspects [9,10]. The presentation varies considerably by ethnicity, and in high-risk populations such as South Asian and Indigenous women, prevalence and complications are elevated. PCOS is a lifelong condition that commences with menstrual irregularities with or without hirsutism in adolescents and progresses to cardiovascular disease in later life [11]. Given the substantial number of women affected by PCOS and its significant impact on patients and their families, a comprehensive understanding of the current burden and clinical characteristics is crucial. However, most epidemiological studies on PCOS have been conducted in developed countries, with limited information on the burden in other parts of the world [12,13]. A research study indicated that over one-quarter of participants (27.4%) had a first-degree relative with PCOS, and 12% had a first-degree relative with type 2 diabetes [14]. Meanwhile, there is scarce data on the epidemiology and clinical, metabolic, and endocrine aspects of PCOS in Bangladeshi women. The study aims to explore the diagnosis and treatment procedures for managing adolescent PCOD in Bangladesh.

## METHODOLOGY & MATERIALS

This cross-sectional investigation took place among recently diagnosed, consecutive adolescent patients with Polycystic Ovary Syndrome (PCOS) who were attending at the Holly lab hospital & Missionary Hospital Brahmanbaria, Bangladesh. The study spanned one year from January 2023 to December 2023. The diagnosis of PCOS in adolescent girls was established through the identification of clinical and biochemical evidence of hyperandrogenism (after excluding other potential pathologies) alongside persistent menstrual irregularities. A one-on-one, semi-structured questionnaire interview was conducted to gather comprehensive clinical presentation and medical history information.

- **Inclusion Criteria:** All female participants within the age range of 10 to 19 years.
- **Exclusion Criteria:** Patients undergoing drug treatment for diabetes, hypertension, dyslipidemia, and obesity, as well as those with pelvic inflammatory disease, any chronic debilitating illness, or malignancy.

Statistical analyses were conducted using Statistical Packages for Social Sciences for Windows, version 23.0 software (SPSS). Categorical variables were expressed as a percentage (%), measurable variables with a normal distribution were presented as mean  $\pm$  standard deviation (SD), and those not adhering to a normal distribution were described as median (interquartile range [IQR]). Logistic regression analysis was performed to pinpoint the risk factors associated with metabolic syndrome among the study subjects. A significance level of  $p \leq 0.05$  was considered for statistical significance.

## RESULT

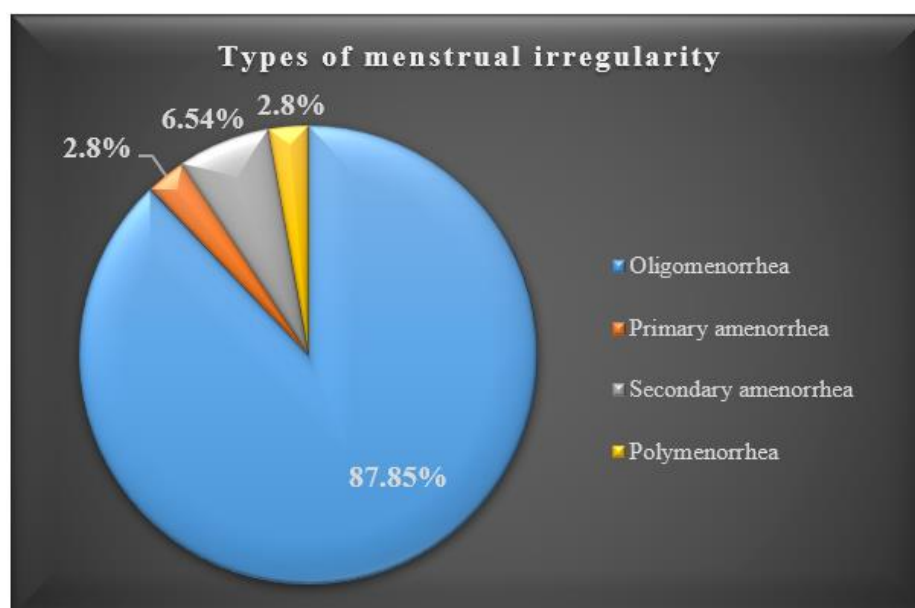
Table 1 shows the demographic and clinical characteristics of 107 adolescent PCOD participants. The majority (55.14%) fell within the 10-15 age range, with an average age of  $16.8 \pm 1.7$  years. The distribution of BMI categories demonstrated a considerable prevalence of overweight (29.70%) and obese (39.40%) participants. A majority (76.60%) exhibited normal blood pressure, while 20.00% were categorized as pre-hypertensive, and 3.40% were hypertension. Regarding glycemic status, a substantial proportion (76.00%) demonstrated normoglycemia, whereas 21.10% were classified as prediabetic, and 2.90% were diagnosed with diabetes mellitus. A significant proportion exhibited dyslipidemia (90.90%), while metabolic syndrome was present in 42.30% of cases. Particularly, biochemical hyperandrogenism was observed in 33.70% of participants. Table 2 outlines the prevalent PCOD features within the study population where, hirsutism was notably present in 94.90% of participants, indicating a high incidence of excess male-pattern hair growth. Menstrual irregularities were predominantly characterized by oligomenorrhea (87.85%), while primary amenorrhea, secondary amenorrhea, and polymenorrhea were observed in 2.80%, 6.54%, and 2.80% of cases, respectively (Figure 1). Ovarian morphology assessed through ultrasound revealed diverse patterns, with 24% having normal morphology, 30.9% exhibiting typical polycystic ovaries, and 45.1% displaying increased ovarian volume. Figure 2 illustrates the distribution of diagnoses in the study population with PCOD. The primary contributing factors to diagnosis include hyperandrogenism (25.23%), indicating the presence of elevated androgens; ovulatory dysfunction (34.58%), suggesting irregularities in the ovulation process; ovarian morphology (14.02%), highlighting structural variations observed through imaging; and

metabolic factors (26.17%), emphasizing the involvement of metabolic aspects. The diverse treatment strategies employed for PCOD patients within the study cohort (N=107) are presented in Table 3. Classical treatment options were prevalent, with 34.58% of participants receiving conventional interventions. Lifestyle interventions, including weight loss and physical activity, were implemented in 14.95% of cases,

emphasizing the significance of non-pharmacological approaches. Combined Oral Contraception (12.15%) and antiandrogens such as Spironolactone/Finasteride (7.48%) were also utilized. Additionally, therapeutic treatments included N-acetylcysteine (4.67%), Inositol's (3.74%), Vitamin D supplementation (9.35%), and Chromium supplementation (6.54%).

**Table 1: Demographic and clinical characteristics of study participants (N=107)**

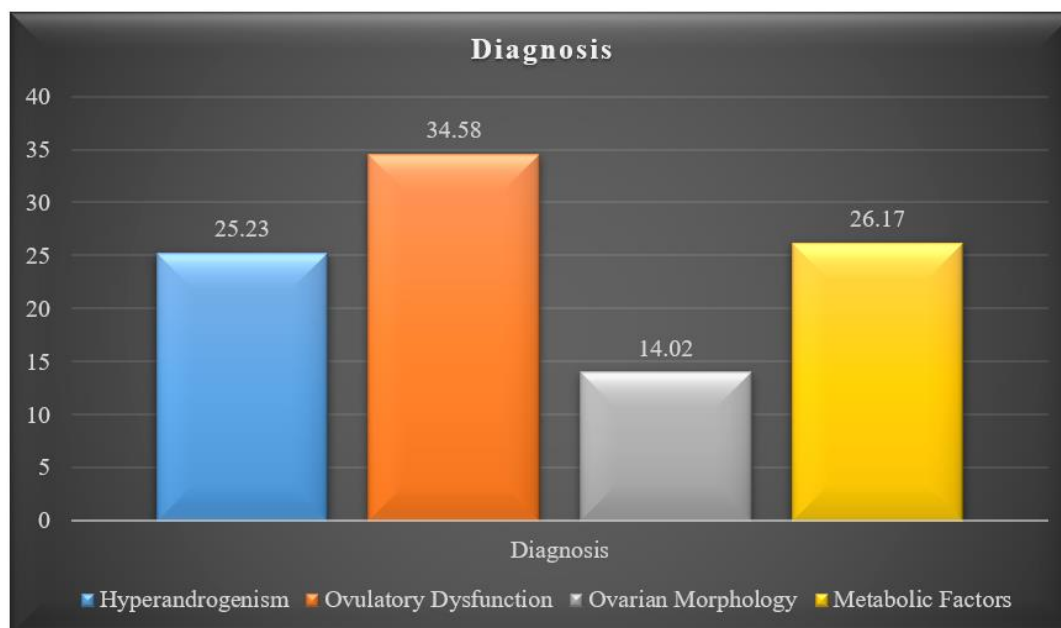
Age in years	Frequency (n)	Percentage (%)
10-15	59	55.14
16-19	48	44.86
Mean±SD	16.8 ± 1.7	
BMI category		
Underweight	7	6.30
Normal weight	26	24.60
Overweight	32	29.70
Obese	42	39.40
Abdominal obesity		
Normal	82	76.60
Pre-HTN	21	20.00
HTN	4	3.40
Glycemic status		
Normoglycemia	81	76.00
Prediabetes	23	21.10
Diabetes mellitus	3	2.90
Dyslipidemia		
Present	97	90.90
Absent	10	9.10
Metabolic syndrome		
Present	45	42.30
Absent	62	57.70
Biochemical hyperandrogenism		
Present	36	33.70
Absent	71	66.30



**Figure 1: Types of menstrual irregularity**

**Table 2: PCOD feature of the study population**

PCOS features	Frequency (n)	Percentage (%)
<b>Hirsutism</b>		
Present	102	94.90
Absent	5	5.10
<b>Ovarian morphology in USG</b>		
Normal	26	24
Typical PCO	33	30.9
Increased ovarian volume	48	45.1

**Figure 1: Diagnosis of PCOD****Table 3: Treatment strategy for PCOD patients (N=107)**

Variables	Frequency (n)	Percentage (%)
<b>Treatment</b>		
Classical treatment options	37	34.58
Lifestyle interventions (weight loss and physical activity)	16	14.95
Combined Oral Contraception (estrogen and progestin combinations)	13	12.15
Ntiandrogens (Spironolactone/Finasteride)	8	7.48
Eflornithine (topical)	5	4.67
<b>Therapeutic treatment</b>		
N-acetylcysteine	5	4.67
Inositol's (myo-inositol and D-chiro-inositol)	4	3.74
Vitamin D supplementation	10	9.35
Chromium supplementation	7	6.54
Orlistat	2	1.87

## DISCUSSION

PCOD in adolescents is an emerging problem. To our knowledge, this study will be in the short list of PCOD related in Bangladesh, describing the management of adolescents with PCOD. The mean age of the study is  $16.8 \pm 1.7$  years and almost 40% of the study population was obese. In this study, most 102(94.9%) patients had hirsutism. A very high frequency of dyslipidemia (90.9%) was observed and the prevalence of metabolic syndrome was also considerably high (42.3%). In adolescents, natural maturity

characteristics usually overlap with signs and symptoms of PCOD. This issue leads to particular diagnostic problems, and based on the evidence, the debate on the aetiopathogenesis, diagnostic criteria and suggestions for PCOD in adolescents continues [15].

The diagnostic challenge in adolescents may be due to many reasons, such as the higher rate of physiologic anovulatory cycles, irregular menses during the first 2 years following menarche, and the presence of acne in this age group [16]. Due to these transitory



symptoms and signs mimicking PCOD during adolescence, care must be taken to avoid premature labeling of a case as PCOD to avoid overtreatment and psychological stress. The presence of oligomenorrhea among adolescent girls 2 years post-menarche is a good screening indicator to diagnose a probable case of PCOS. Diagnosis is confirmed if there is clinical and/ or biochemical evidence of hyperandrogenism in the presence of persistent menstrual irregularities [17]. Worldwide, PCOS in adolescents is an emerging problem that needs careful assessment, timely intervention, and appropriate treatment [18]. In this study, 94(87.85%) of the patients had oligomenorrhea, 3(2.80%) had primary amenorrhea, 7(6.54%) had secondary amenorrhea, and 3(2.8%) had polymenorrhea. these findings are similar to a study done by Kamrul *et al.*, (2021) in Bangladesh [19]. In Indian adolescents diagnosed with PCOS, Balaji *et al.*, found that 28% of girls have oligomenorrhea and 18% have secondary amenorrhea [20]. Hirsutism was present in almost all (94.9%) of the patients in our study. The prevalence of hirsutism observed in India among similar patients was variable and lower than our observations [20-22].

In our study, the majority of the patients were overweight (29.7%) and obese (39.4%), respectively though a small portion was underweight (6.3%). In a study by Balaji *et al.*, in Indian adolescents with PCOS, the prevalence of underweight, normal weight, overweight, and obesity was 14%, 71%, 9%, and 2%, respectively [20]. This suggests that obesity status in PCOS is variable, even in similar populations, and may be influenced by the cutoff values of BMI used to define overweight and obese people. In this study underscores the use of standard diagnostic criteria for PCOD for adolescents was done (Figure 1). Also, the treatment of Adolescent Polycystic Ovary Syndrome (PCOD) involves a multidisciplinary approach aimed at managing symptoms and addressing underlying hormonal imbalances (Table 3). Lifestyle modifications, including a balanced diet and regular exercise, play a crucial role in weight management and insulin sensitivity.

Hormonal contraceptives may be prescribed to regulate menstrual cycles and reduce androgen levels. In some cases, anti-androgen medications are used to manage symptoms like acne and excess hair growth. Close monitoring of metabolic parameters is essential. Education on long-term health implications and psychological support are integral components of adolescent PCOD management, ensuring comprehensive care for this common endocrine disorder.

**Limitations of the study:** The study's findings may only be universally applicable if it focuses on adolescent PCOD cases in a specific medical facility in Bangladesh. Factors such as regional variations, socio-economic differences, and healthcare infrastructure may affect the generalizability of the results. The cross-sectional design

provides a snapshot of the participants' status at a specific point, limiting the ability to establish causal relationships or observe changes over time. Longitudinal studies would offer a more comprehensive understanding of the dynamic nature of adolescent PCOD. The study's sample size might be relatively small, potentially affecting the statistical power and precision of the results. A more extensive and diverse sample could enhance the study's reliability and applicability. Concentrating on a single medical centre may introduce selection bias and overlook variations in healthcare practices. Including multiple centres would provide a more comprehensive perspective on managing adolescent PCOD in Bangladesh.

## CONCLUSION AND RECOMMENDATIONS

In conclusion, managing adolescent Polycystic Ovary Syndrome (PCOS) poses a real challenge, with a high prevalence of metabolic complications observed in our study population. The diagnostic complexity in adolescents underscores the need for careful evaluation to avoid premature labelling and psychological stress. Lifestyle interventions, hormonal contraceptives, and anti-androgen medications form a multifaceted treatment strategy. Our findings emphasize the importance of standardized diagnostic criteria and a comprehensive, multidisciplinary approach for effective management. Early intervention and continuous monitoring are crucial for mitigating long-term health risks. Further research on PCOD in diverse populations is recommended for a more nuanced understanding and tailored interventions.

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**Conflict of Interest:** None declared.

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