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Current Trends & Recent Guidelines in Obstetrics and Gynecology

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Foreword
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CHAPTER

6

Adolescent Polycystic Ovary Syndrome

Rachna Dubey, Kanchan Sharma, Meera Agnihotri

INTRODUCTION

American Gynecologists Irving and Leventhal in 1935 jointly published disease Stein–Leventhal syndrome, a hairy female with menstrual irregularities and hirsutism with enlarged ovaries having multiple cysts on laparotomy. Ultrasound and laparoscopy was not there. Many changes followed thereafter—Rotterdam Criteria 2003 and the National Institutes of Health (NIH) criteria 2006. Further guidelines revised in 2013 and 2018. Disease is now called polycystic ovary syndrome (PCOS) instead polycystic ovarian disease (PCOD).[1,2]

Latest international evidence-based guidelines for diagnosis and management of PCOS including the European Society of Human Reproduction and Embryology (ESHRE), the American Society for Reproductive Medicine (ASRM), and the European Society of Endocrinology published on 15th August 2023, updated previous 2018 guidelines, after 5 years of research including assessment of 17 evidence-based and 54 consensus recommendations, and 123 points.

DEFINITION

Polycystic ovary syndrome is complex heterogeneous endocrinopathy affecting adolescents and women in reproductive years characterized by:

- Hyperandrogenism—clinical/biochemical
- Menstrual irregularities/ovulatory dysfunction

It also has the potential to cause metabolic syndrome.[3]

Revised Definition

Polycystic ovary syndrome is a complex heterogeneous endocrinopathy causing metabolic, steroidogenic, and reproductive dysfunction. It is *programmed in utero* in genetically Predisposed fetuses. So it is transferred from womb-to-tomb and is a multisystemic metabolic disorder.[3,4]

ADOLESCENCE

The World Health Organization (WHO) defines adolescence as the period between 10 and 19 years. Adolescent is a critical period of transition between young child who develops into adult.[3]

- Adolescent PCOS
- Adult PCOS

INCIDENCE

Polycystic ovary syndrome is one of the most common endocrinopathy affecting women.[5,6]

- 36% adolescent girls suffer from PCOS in India
- 3.7–22.5% with 9.13% women of reproductive age

Variation in prevalence is due to heterogeneous symptom presentation, diagnostic criteria practiced, diagnostic limitations, age group, and ethnicity.

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SYMPTOMS OF ADOLESCENT PCOS[6]

- Menstrual cycle disturbance 70%
  - Oligomenorrhea 50%
  - Amenorrhea 10%
  - Abnormal heavy bleeding 10–15%
  - Hyperandrogenism 70%
- Acne 30–40%
- Hirsutism 70%
- Alopecia 10%
- Acanthosis nigricans 1–3% lean and 20% obese[7]

Clinical symptoms and signs of hyperandrogenism including acne, female pattern hair loss, and hirsutism are seen in adults. Severe acne and hirsutism are seen in adolescents.[8,9]

- Obesity 50–60%
- Normal menstruation 20%
- Infertility 70%
- Early pregnancy loss 50–60%

ETIOLOGY

Polycystic ovary syndrome eclipse mother to conceptus, from womb-to-tomb and then to next-generations causes:

- Genetic
- Endocrine (hormonal)
- Metabolic
- Immunological

Causes may be *One or All.*[10]

CHANGING DIAGNOSTIC CRITERIA

Classic Stein–Leventhal syndrome, 1935:

- NIH criteria 1990[11]
- Rotterdam diagnostic criteria 2003
- Androgen Excess Society 2006
- 2018 criteria
- Updated international evidence-based criteria 2023 **(Table 1)**.[10]

TABLE 1: PCOS criteria of 2018 and modification done in 2023.

2018 criteria of PCOS (international, ESHRE, and ASRM)	***Modified 2023 criteria (15th August 2023)***
Old diagnostic criteria by the same group—irregular cycles ovulatory dysfunction, clinical and/or biochemical hyperandrogenism, and ultrasound	• Due to overuse of ultrasound the recent 2023 guidelines recommends irregular menstrual cycles/ ovulatory dysfunction, clinical and/or biochemical hyperandrogenism • Two criteria are sufficient for diagnosis of adolescent PCOS
AMH not included	• Ultrasound may not be taken • Ultrasound morphology may be replaced by AMH levels in adults but not in adolescents

(AMH: anti-Müllerian hormone; ASRM: American Society for Reproductive Medicine; ESHRE: European Society of Human Reproduction and Embryology; PCOS: polycystic ovary syndrome)

Rotterdam Criteria

The ESHRE and ASRM had joint consensus, in Rotterdam, the Netherlands in 2003. They defined PCOS when two out of following three criteria are present **(Table 2)**:

1. Irregular cycle and/or anovulation
2. Hyperandrogenism (Clinical, Biochemical)
3. Polycystic ovaries, excluding other etiology ultrasound FINDINGS are not diagnostic[12]

ADOLESCENT PCOS IS DIFFERENT FROM ADULT PCOS BECAUSE OF MANY CHALLENGES IN THE DIAGNOSIS OF ADOLESCENT PCOS

- Adolescent PCOS has challenges due to overlapping symptoms of puberty.

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TABLE 2: Changing guidelines—adolescent PCOS as per the Rotterdam criteria of diagnosis (2023).

Adults (2 out of 3)	*Adolescents (3 out of 3)*	*Adolescents (2019–2023)*
Androgen excess/ hyperandrogenemia	Clinical or biochemical hyperandrogenism	Irregular cycles
Ovulatory dysfunction	• Menstrual • Irregularity • Oligo- or anovulation	Clinical and/or biochemical hyperandrogenism
Polycystic ovaries (USG)	At least one/both ovary • 12 follicles 2–9 mm • Volume >10 mL	• Ultrasound and AMH not needed • Nondependable

(AMH: anti-Müllerian hormone; PCOS: polycystic ovary syndrome; USG: ultrasonography)

- Menstrual irregularity is common after menarche (1–2 years), which maybe earliest signs of adolescent PCOS. Many symptoms of early pubertal development overlap, because of immature hypothalamic–pituitary–ovarian (HPO) axis—anovulation and hirsutism may be seen. While hyperandrogenism and menstrual irregularities are also key to diagnose adolescent PCOS.[12]

Risk Factors of PCOS[13]

- Intrauterine exposure to androgen excess
- Intrauterine growth retardation
- High body mass index (BMI) >97.5 percentile for age in adolescents
- Family history of diabetes, PCOS, obesity, or dyslipidemia
- Persistent menstrual irregularity
- Insulin resistance[2,10,11]
- Presence of polycystic ovary (PCO) on USG
- Frequent relapse in acne hyperandrogenism
- Moderate to severe hirsutism >2 years[14]

ADOLESCENT PCOS AND ADOLESCENT AT RISK PCOS

For adolescents who have features of PCOS, but do not meet diagnostic criteria, are at "increased risk" of adult PCOS and complication **(Fig. 1)**. They should be advised reassessment at or before full reproductive maturity 8 years postmenarche. They have persisting features, significant weight gain, and hirsutism in adolescent. Ovulatory dysfunction can occur with regular cycles. An ovulation confirmed by serum progesterone levels **(Flowchart 1 and Table 3)**.[5]

PATHOLOGY

Different theories have been proposed about the mechanisms responsible for hyperandrogenism and insulin resistance during the premenarcheal, pubertal, and adolescent stages. New approaches to the study of PCOS are also arising such as the impact of inflammatory cytokines or the importance of free fatty acids and fat metabolism in the genesis of obesity, insulin resistance, and glucose tolerance impairment followed by impaired flocculence's-anovulation **(Figs. 2A and B)**.[2,7,15]

DIAGNOSIS OF POLYCYSTIC OVARY SYNDROME IN ADOLESCENT GIRLS

Irregular Menstrual Cycles

Diagnosis of PCOS should be considered in adolescents, when irregular menstrual cycles are present.

Irregular menstrual cycles in the initial 1-year postmenarche are considered normal

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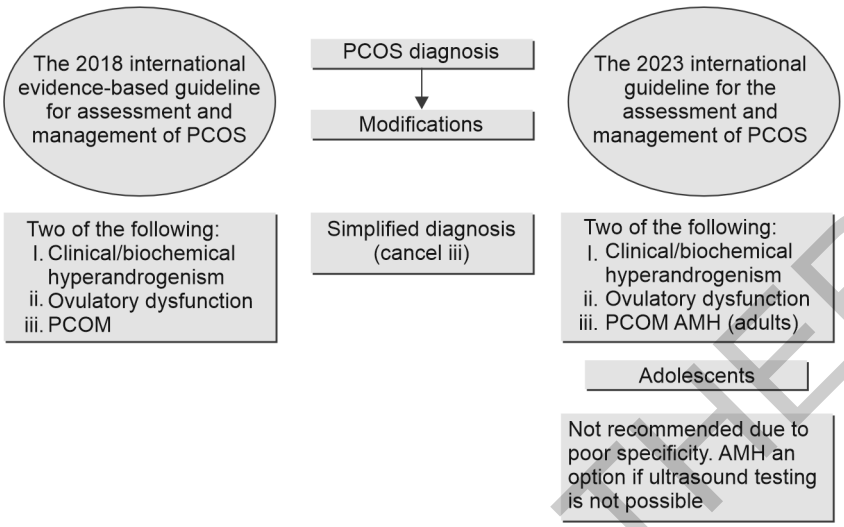
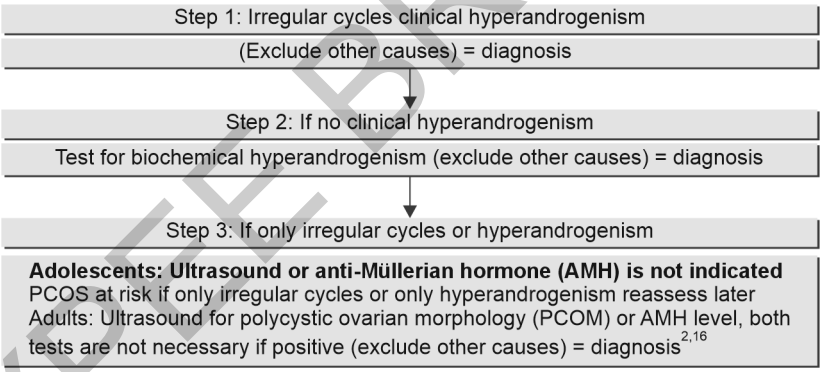


Fig. 1: PCOS diagnosis. (AMH: anti-Müllerian hormone; PCOM: polycystic ovarian morphology; PCOS: polycystic ovary syndrome)

Flowchart 1: Steps to diagnosis polycystic ovary syndrome (PCOS) in adolescent.



during pubertal transition. A girl is said to have irregular menstrual cycle if:

- Cycle length is >90 days for any one cycle after 1-year postmenarche or,
- Cycle duration is <21 or >45 days after 1-year to <3 years postmenarche or,[8,17]
- Cycle duration is <21 or >35 days >3 years postmenarche or <8 cycles per year or,
- Primary amenorrhea by 15 years age or >3 years post-thelarche (breast development).[10]

Irregular cycle in PCOS is considered as per guidelines. Ovulatory dysfunction can occur with regular cycles, and anovulation is confirmed by progesterone levels.

Hyperandrogenism

Hyperandrogenism is defined as hirsutism, severe acne, and/or biochemical hyperandrogenemia:

- Clinical manifestation[3,4]
- Biochemical evidence

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TABLE 3: Differential diagnosis.

Common conditions	*Less common diseases*
• *Thyroid disease:* Abnormal thyroid-stimulating hormone (TSH) levels • *Late-onset congenital adrenal hyperplasia (CAH):* High early morning and/or post-adrenocorticotropic hormone (ACTH) stimulated 17-OHP levels • *Hyperprolactinemia:* Raised prolactin levels	• *Pregnancy:* High human chorionic gonadotropin (hCG) • *Hypothalamic amenorrhea:* Low/normal follicle-stimulating hormone (FSH) and luteinizing hormone (LH) with low estradiol levels • *Primary ovarian failure:* Low estradiol and raised FSH and LH levels • *Androgen secreting tumors:* – Testosterone >5 nmol/L, elevated DHEAS levels and imaging evidence of tumor – Cushing's syndrome two clinical and evidence – Biochemical of hypercortisolism

- Increase in production of androgens by ovaries (PCOS and ovarian tumor)
- Increase in sensitivity of hair follicle to androgen (genetic).[6,15]
- Increase in androgen production by adrenal glands [nonclassical congenital adrenal hyperplasia (NCAH)]
- Insulin resistance
- Hyperandrogenism, insulin resistance, and acanthosis nigricans (HAIR-AN syndrome)
- Increase in production of cortisol by adrenal glands (Cushing's syndrome)[13,18]
- Tests to exclude these conditions include serum thyroid-stimulating hormone (TSH), prolactin, gonadotropins androgens, and/or 17-OHP levels. Imaging is required to evaluate ovaries and/or adrenals, if serum androgen levels are twice above the upper limit of reference range
- Evaluate the values of dehydroepiandrosterone sulfate (DHEAS)[19,20]

Clinical Hyperandrogenism

Hyperandrogenism is clinically manifested in the form of hirsutism and severe acne in adolescents.

Modified Ferriman–Gallwey score (mFG) evaluates terminal hairs in nine primarily androgen dependent areas and depending on ethnicity, an arbitrary score ≥4–6 indicates hirsutism based on the 95th percentile. Evaluation should include detailed history and inquiry regarding hair removal or laser treatment.[3]

Hirsutism is important complaint, must be treated for psychosocial well-being of adolescent **(Fig. 3)**.

Severe acne is the other clinical presentation of hyperandrogenism. Only severe acne is considered for diagnosing adolescent PCOS as per the recent guidelines (i.e., 10 or more facial lesions) **(Figs. 4A to C)**.

Biochemical Hyperandrogenism

Role of biochemical hyperandrogenism is when clinical hyperandrogenism is unclear. Use total testosterone and free testosterone (FT) for diagnosis. If not elevated, androstenedione and DHEAS could be measured, but have limited role.[9,21]

For more accuracy:

- Highly accurate liquid chromatography–mass spectrometry (LC–MS)
- Extraction/chromatography immunoassays Free testosterone is more accurate. Direct FT assays: should not be used. (Poor sensitivity, accuracy. Radiometric or enzyme-linked assays)

$$\text{Free androgen index (FAI)} = \frac{100 \times (\text{Total testosterone})}{\text{Sex hormone-binding globulin (SHBG)}}$$

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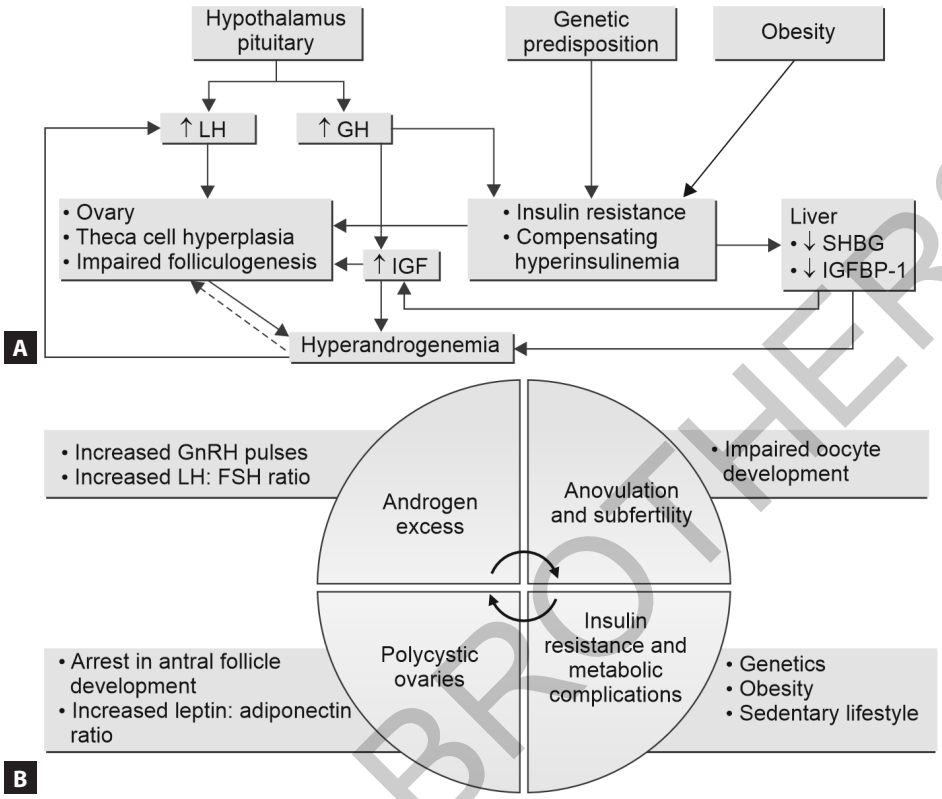

Figs. 2A and B: Pathophysiology.

- Total testosterone can identify 20–30% of women with PCOS–upper limit → 55 ng/dL
- FT identify 50–60% androgenism–upper limit → 9 pg/mL
- Girl on combined oral contraceptives (COCs)—3 months drug free interval needed before testing androgen
- Persistent elevation total and/or FT indicates hyperandrogenism in adolescent.[17,21]

Ultrasound and Polycystic Ovarian Morphology

- Ultrasound not recommended for diagnosis of adolescent PCOS with irregular menstrual cycle + hyperandrogenism. High incidence of multifollicular ovary in this age.
- *We do not use* ultrasound for diagnosis of adolescent PCOS, in age <8 years after menarche.[5]
- Using ultrasound transducers with frequency bandwidth 8 MHz, the polycystic ovarian morphology (PCOM) threshold is follicle number per ovary ≥20 and follicle number per cross section >10 at least in one ovary. Avoid corpora lutea and dominant follicles cysts.[8]
- An ovarian volume >10 mL on either ovary
- In adults, as alternative to pelvic ultrasound serum anti-Müllerian hormone (AMH) could be used.
- Either serum AMH or ultrasound is used but not both (avoid overdiagnosis).

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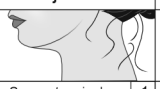
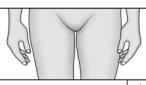
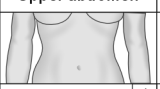
Age_____Height_____Weight_____Body mass index_____ Blood pressure_____

Caucasian ☐ African American ☐ Asian ☐ N. American indian ☐ Mediterranean ☐

Upper lip	Sideburn area	Chin	Lower jaw and neck	Upper back	Lower back	←Subtotal
						
Small number of terminal hairs over upper lips and outer lip border 1	Sparse terminal hairs 1	Sparse terminal hairs on chin 1	Sparse terminal hairs over lower jaw and upper neck 1	Sparse terminal hairs over upper back 1	Sacral area with hair coverage less than 4 cm wide 1	
Thin moustache covering less than 50% of upper lip or at the outer border 2	Sparse terminal hairs with small thickened areas 2	Sparse terminal hairs with small thickened areas 2	Sparse terminal hairs with small thickened areas 2	Increased number of spread terminal hairs 2	Increased sides coverage 2	
Moustache covering 50% from outer margin of the lip or 50% the lip height 3	Light hair growth over sideburn area 3	Entire chin covered with light growth 3	Entire area covered with light growth 3	Entire area covered with light growth 3	75% of lower back covered with terminal hairs 3	
Moustache covering most of upper lip and crossing the midline lip 4	Thick growth over sideburn area 4	Entire chin covered with heavy growth 4	Entire area covered with heavy growth 4	Entire area covered with heavy growth 4	Entire area covered with heavy growth 4	

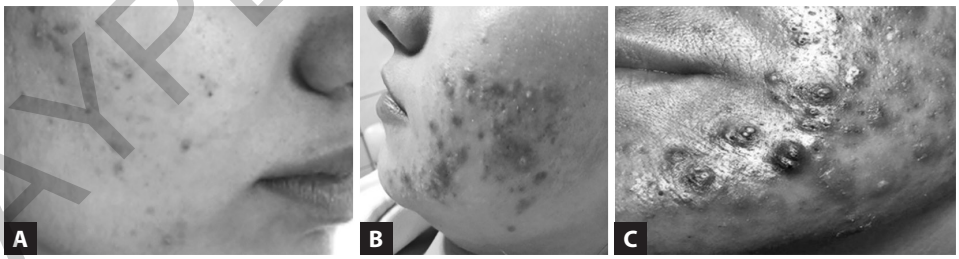
Upper arm	Thigh	Chest	Upper abdomen	Lower abdomen	Perineum	←Subtotal
						
Scattered terminal hairs over less than 25% of upper arm 1	Scattered terminal hairs over less than 25% of upper thigh 1	Circumareolar or midline terminal hairs 1	Scattered midline terminal hairs 1	Small number of scattered midline terminal hairs thelength of linea alba 1	Scattered perianal terminal hairs 1	
Increased but incomplete coverage 2	Increased but incomplete coverage 2	Circumareolar and midline terminal hairs 2	More terminal hairs, still midline 2	Midline concentration of terminal hair the length of the linea alba 2	Spread of terminal hair to the gluteal cleft 2	
Entire area covered with light growth 3	Entire area covered with light growth 3	75% of chest covered with terminal hair 3	50% of upper abdomen covered 3	A midline thickened band of terminal hair less than ½ width of pubic hair at base 3	75% of perineum covered with terminal hairs 3	
Entire area covered with heavy growth 4	Entire area covered with heavy growth 4	Entire area covered with terminal hair growth 4	Entire area covered with terminal hair growth 4	An inverted V-Shaped coverage ½ width of pubic hair at base 4	Entire area covered with terminal hair growth 4	

Nine body areas:

- Upper lip, chin, chest,
- Upper and lower back
- Upper and lower abdomen
- Upper arm and thigh

>4–6 on mFG depending on ethnicity
>3 in white and black women
>5 in mongoloid Asian

Fig. 3: Clinical assessment of hirsutism modified Ferriman–Gallwey score (mFG).



Figs. 4A to C: Clinical hyperandrogenism. (A) Acne; (B) Moderate acne; and (C) Severe acne.

- PCOM is present in 20–35 girls with normal menstrual cycles. In contrast, PCOS may not show PCOM on ultrasound.[9]
- Transvaginal ultrasound preferred for adult PCOS, if sexually active **(Fig. 5)**.[15]

Anti-Müllerian Hormone (AMH)

Serum AMH could be used for defining PCOM in adults as an alternative to pelvic ultrasound. Either serum AMH or ultrasound may be used but not both to avoid overdiagnosis.

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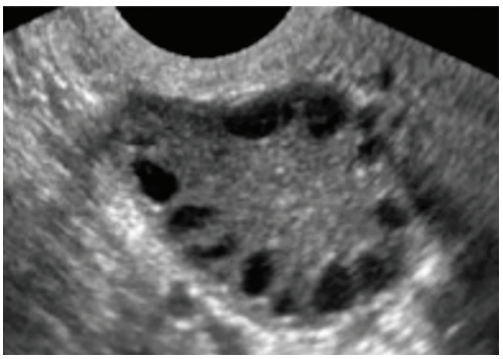

Fig. 5: Transvaginal ultrasound.

AMH should not be used as a single test to diagnosis PCOS. AMH level is not necessary for PCOS. AMH is alternative to ultrasound in adult only not use in adolescent. Serum AHM is low with high BMI, it is also low in patient on COC.

Treatment of Hirsutism[18]

- All combinations of oral contraceptive pills (OCPs) are effective.
- OCPs decrease androgen levels by suppressing luteinizing hormone (LH) and stimulating SHBG.
- OCPs with low androgenic progestins (norgestimate and desogestrel) may be most effective for acne and hirsutism (Level B).[5]
- Prolonged (>6 months) medical therapy for hirsutism is necessary to document effectiveness (Level B).[12]
- Antiandrogens should not be used without effective contraception (Level B).
- Flutamide is of limited value because of its dose-dependent hepatotoxicity (Level B).
- Drospirenone in the dosage used in some OCPs is not antiandrogenic (Level B).
- Weight reductions/lifestyle treatment
- Insulin sensitizers/metformin (reduces hirsutism after 12 months treatment) (Level A)
- *Low dose OCs:*
  - With cyproterone acetate
  - Drospirenone
- *Antiandrogenic drugs:*
  - Spironolactone 25–100 mg/BD
  - Flutamide 125–250 mg/day
  - Finasteride
  - Eflornithine (topical use)
- *Local treatment:*
  - Shaving, plucking, waxing, and bleaching
  - Depilatory creams, electrolysis, and laser[17]

WHICH PROGESTOGENS IN ORAL CONTRACEPTIVE PILL?

- *Nonandrogenic progestogens:*
  - Desogestrel 0.15 mg + EE 30 μg (Novelon)
  - Desogestrel 0.15 mg + EE 20 μg (Femilon)
- *Antiandrogens with progestational activity:*
  - Cyproterone acetate (EE 30 μg + C2 mg – Diane 35)
  - Drospirenone (EE 30 μg + D3 mg – Yasmin)
- *Low-dose COC pill is the choice:*
  - In adolescent girls, start with EE 20 μg pill (<35 μg EE is the choice)

Metformin and Polycystic Ovary Syndrome

Metformin is an insulin sensitizer for over seven decides in type 2 diabetes and several decades in PCOS. 75% of lean PCOS and 95% of the high BMI PCOS.

Metformin alone could be considered in adolescents at risk of or with PCOS for cycle regulation, acknowledging limited evidence.

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Other Insulin Sensitizers—Role of Inositol and Myo-inositol[13]

Myo-inositol (MI) and D-chiro-inositol (DCI) are isomers of inositol that act as insulin sensitizers. MI helps in follicle-stimulating hormone (FSH) signaling, while DCI improves peripheral insulin sensitivity and androgen synthesis. This inositol can be used alone or in combination to manage PCOS, often in a 40:1 ratio (MI:DCI), which is considered physiological.[16]

N-acetyl cysteine also has insulin sensitizer action.

Although there is no documented evidence of their use to improve features such as menstrual irregularity, acne, and hirsutism.

Surgical treatment—not recommended **(Fig. 6)**.

FUTURE OF ADOLESCENT POLYCYSTIC OVARY SYNDROME

These adolescents may have:

- Future infertility problems
- Metabolic syndromes such as diabetes, hypertension, heart disease, and central obesity
- May transfer PCOS to next generation[2,6,16]



Fig. 6: Laparoscopic ovarian drilling in adolescents polycystic ovary syndrome (PCOS)—not recommended.

CONCLUSION

- Adolescents PCOS diagnosed having hyperandrogenism and irregular menstrual cycle/ovulatory dysfunction, do not require ovarian ultrasound or AMH.
- The international guidelines emphasized accurate and consistent criteria for diagnosis and advocating identification of adolescents at-risk of PCOS—if only one symptom is present: Hyperandrogenism clinical and or biochemical or presenting menstrual irregularities, obesity, acne, etc., but complete criteria does not fit.
- Complete diagnosis of adolescent PCOS is not needed to initiate treatment; hence, symptomatic treatment should be started for adolescents at risk with abnormal uterine bleeding (AUB), hirsutism, or acne.
- Treatment should be individualized. Goal of treatment is to improve symptom relief, improved quality life, and psychological upset for hairy bodies, to prevent the occurrence of long-term health consequences even in the absence of a definitive diagnosis.
- The lifestyle intervention is mainstay of PCOS treatment and obese/overweight individuals are encouraged to optimize weight, diet, nutrition, exercise, and yoga. Counseling of patient and family.
- The pharmacologic treatment should be individualized **(Flowchart 2)**. First-line treatment to regulate menstrual cycle is COCs with or without metformin. Metformin is an insulin sensitizers.
- COCs with cyproterone acetate can be tailored for hirsutism with irregular menstrual cycle.
- Myoinositol and inositol have limited role.

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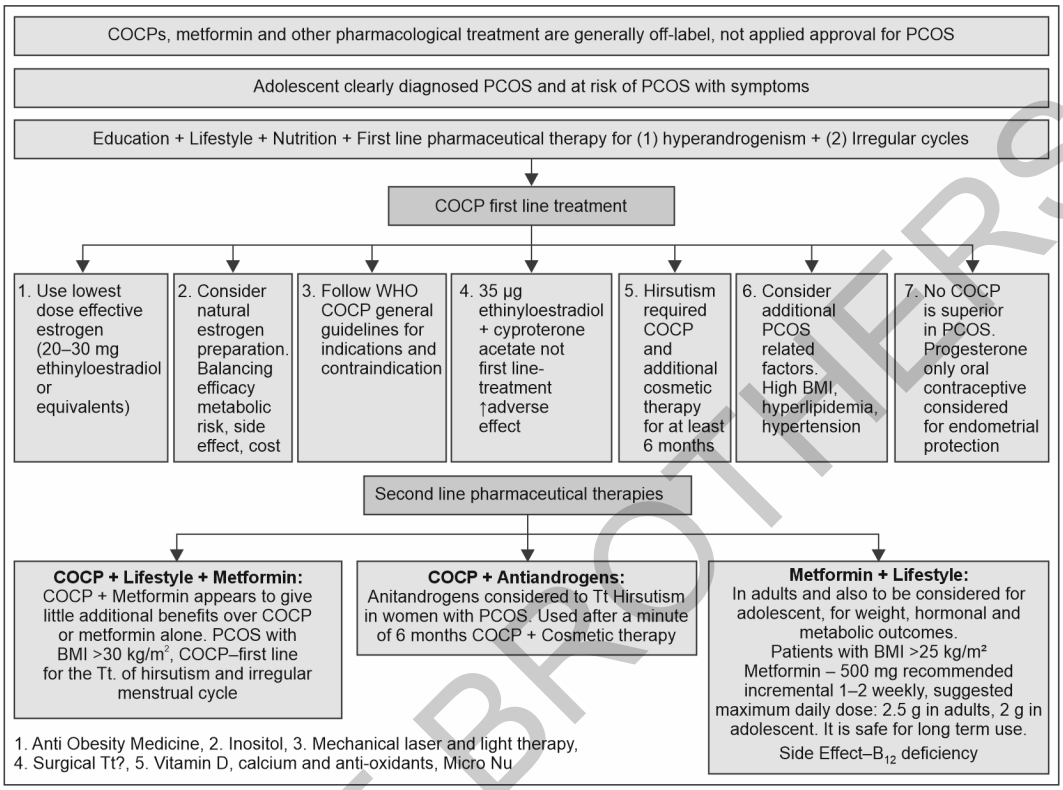
Flowchart 2: Pharmacological treatment of adolescent PCOS.



(BMI: body mass index; COCPs: combined oral contraceptive pills; PCOS: polycystic ovary syndrome)

- Ovarian drilling has limited role and bariatric surgery has some role with gross obesity and abnormal eating habits.
- Cosmetic and laser surgery are also considered to add beautification to adolescent girls.
- Special attention to be given for depression, psychological management for altered appearance.

REFERENCES

1. Ibáñez L, Oberfield SE, Witchel S, Auchus RJ, Chang RJ, Codner E, et al. An International Consortium Update: Pathophysiology, Diagnosis, and Treatment of Polycystic Ovarian Syndrome in Adolescence. Horm Res Paediatr. 2017;88(6):371-95.
2. Witchel SF, Oberfield S, Rosenfield RL, Codner E, Bonny A, Ibáñez L, et al. The diagnosis of polycystic ovary syndrome during adolescence. Horm Res Paediatr. 2015;83(6):376-89.
3. Peña AS, Witchel SF, Hoeger KM, Oberfield SE, Vogiatzi MG, Misso M, et al. Adolescent polycystic ovary syndrome according to the international evidence-based guideline. BMC Med. 2020;18(1):72.
4. Gibson Helm M, Teede H, Dunaif A, Dokras A. Delayed diagnosis and a lack of information associated with dissatisfaction in women with polycystic ovary syndrome. J Clin Endocrinol Metab. 2016;10(2): 2016-963.
5. Kristensen SL, Ramlau-Hansen CH, Ernst E, Olsen SF, Bonde JP, Vested A, et al. A very

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large proportion of young Danish women have polycystic ovaries: is a revision of the Rotterdam criteria needed? Human Reprod. 2010;25(12):3117-22.
6. Celik HG, Çelik E, Polat I. Evaluation of biochemical hyperandrogenism in adolescent girls with menstrual irregularities. J Med Biochem. 2018;37(1):7-11.
7. Zore T, Lizneva D, Brakta S, Walker W, Suturina L, Azziz R. Minimal difference in phenotype between adolescents and young adults with polycystic ovary syndrome. Fertil Steril. 2019;111(2):389-96.
8. Lucky AW, Biro FM, Daniels SR, Cedars MI, Khoury PR, Morrison JA. The prevalence of upper lip hair in black and 221 white girls during puberty: a new standard. J Pediatr. 2001;138(1):134-6.
9. Rosenfield RL. The diagnosis of polycystic ovary syndrome in adolescents. Pediatrics. 2015;136(6):1154-65.
10. American Academy of Pediatrics Committee on Adolescence; American College of Obstetricians and Gynecologists Committee on Adolescent Health Care; Diaz A, Laufer MR, Breech LL. Menstruation in girls and adolescents: using the menstrual cycle as a vital sign. Pediatrics. 2006;118(5): 2245-50.
11. Kim JY, Tayli H, Michaliszyn SF, Lee S, Nasr A, Arslanian S. Anti-Müllerian hormone in obese adolescent girls with polycystic ovary syndrome. J Adolescent Health. 2017;60(3): 333-9.
12. Kazemi M, Pierson RA, Lujan ME, Chilibeck PD, McBreairty LE, Gordon JJ, et al. Comprehensive evaluation of type 2 diabetes and cardiovascular disease risk profiles in reproductive-age women with polycystic ovary syndrome: a large Canadian cohort. J Obstetr Gynaecol Canada. 2019; 41(10):1453-60.
13. Wekker V, van Dammen L, Koning A, Heida KY, Painter RC, Limpens J, et al. Long-term cardiometabolic disease risk in women with PCOS: a systematic review and meta-analysis. Hum Reprod Update. 2020;26(6):942-60.
14. Lim SS, Norman RJ, Davies MJ, Moran LJ. The effect of obesity on polycystic ovary syndrome: a systematic review and meta-analysis. Obes Rev. 2013;14(2):95-109.
15. Yildiz BO, Bolour S, Woods K, Moore A, Azziz R. Visually scoring hirsutism. Human Reprod Update. 2010;16(1):51-64.
16. LiL, Feng Q, Ye M, He Y, Yao A, Shi K. Metabolic effect of obesity on polycystic ovary syndrome in adolescents: a meta-analysis. J Obstet Gynaecol. 2017;37(8):1036-47.
17. Livadas S, Dracopoulou M, Dastamani A, Sertedaki A, Maniati-Christidi M, Magiakou AM, et al. The spectrum of clinical, hormonal and molecular findings in 280 individuals with nonclassical congenital adrenal hyperplasia caused by mutations of the CYP21A2 gene. Clin Endocrinol. 2015;82(4): 543-9.
18. Codner E, Villarroel C, Eyzaguirre FC, López P, Merino PM, Pérez-Bravo F, et al. Polycystic ovarian morphology in postmenarchal adolescents. Fertil Steril. 2011; 95(2):702-6.e1-2.
19. Villa P, Rossodivita A, Sagnella F, Moruzzi MC, Mariano N, Lassandro AP, et al. Ovarian volume and gluco-insulinaemic markers in the diagnosis of PCOS during adolescence. Clin Endocrinol. 2013;78(2):285-90.
20. Kelsey TW, Dodwell SK, Wilkinson AG, Greve T, Andersen CY, Anderson RA, et al. Ovarian volume throughout life: a validated normative model. PLoS ONE. 2013;8(9): 71465.
21. Teede HJ, Misso ML, Costello MF, Dokras A, Laven J, Moran L, et al. Recommendations from the international evidence-based guideline for the assessment and management of polycystic ovary syndrome. Human Reprod. 2018;33(9):1602-18.

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