NEWS LINE

KARNATAKA ENDOCRINE SOCIETY

6th Issue | October 2024

POLYCYSTIC OVARIES, IMPACTS IN AND OUT OF OVARIES....

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PRESIDENT'S MESSAGE

Dear Colleagues,

It's a great honor for me to serve as the President, Karnataka Endocrine Society. Our KES has done significant academic activities and most physicians, Pediatricians, Gynecologists and Obstetricians are aware of our work. We need to further spread endocrine awareness to other medical specialties in Karnataka. We have been conducting monthly case discussions on virtual platform, quarterly physical meeting inviting doctors across specialties from India who have done original work in endocrinology and most importantly the Annual conference, Hormone Rhythm which is hosted by endocrinologists from tier two cities in Karnataka. We have also started monthly online endocrine awareness programs for public. This Newsletter is our Sixth edition and the theme is PCO. This is in follow up with our previous newsletters published, which received a huge positive response from doctor colleagues across Karnataka of different specialities. I congratulate the editorial team for their efforts and wish the very best to all their present and future endeavors.

FROM THE EDITORS' DESK

Hello again, we are here to present you 6th edition of our newsletter with blessing of God almighty. Let us start thanking all the contributors and others who wanted to contribute but we could not give space. We will make sure next edition you will get priority. Our theme this time is Polycystic Ovaries. This is classic condition which demands multiple specialities, that is exactly we tried to do to involve all specialities from Radiologist, Dermatologist, Gynaecologist to Fertility Specialists. We will start with nomenclature, then diagnosis and treatment, not forgetting the mimickers.

The story of PCO starts in the adolescence age, here we are to hear from our colleagues about adolescent PCO. Also, it does not finish with reproduction, there are a lot now we realised what happens next which also been highlighted by our colleagues.

We sincerely hope our efforts will be of help for practicing doctors in Karnataka across several specialities. We will appreciate your comments, opinion, criticism to make our efforts better.

Dr. Shaila Shamanur Bhattacharyya
President
Karnataka Endocrine Society

Dr. Belinda George
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Editorial Board



WHAT'S IN A NAME - PCOD, PCOM OR PCOS?

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Polycystic ovarian syndrome (PCOS) is a highly prevalent endocrine condition, affecting up to 6-20% of women in reproductive age group. PCOS is now being increasingly recognized as a complex disorder whose pathophysiology remains ill understood,with varying contributions from a genetic predisposition, neuroendocrine dysfunction, insulin resistance, primary androgen excess and several environmental factors including endocrine disruptors. It is now clear that the implications of PCOS extend much beyond its effects on reproductive function, with significant implications on endocrine, cardiometabolic, dermatologic and psychiatric health.

The nomenclature of medical conditions has been in a state of constant flux to keep up with evolution in the understanding of these conditions. The respective professional societies have revisited several conditions to choose names that more accurately reflect the pathophysiology and are inclusive and non-stigmatizing. PCOS is no stranger to this phenomenon, with the evolution of the terminology being fascinatingly reflective of the evolving understanding of this condition. The condition wasformerly known as Stein-Leventhal syndrome, named after the American gynecologists Stein and Leventhal who observed the association of amenorrhea with ovarian cysts and first described the condition in 1935.

The condition was then renamed as polycystic ovarian disorder (PCOD) to reflect the typical ovarian morphology associated with this condition. While this name garnered traction in both the scientific community and the public alike, it was misleading as it implied the ovarian morphology as the sine qua non of the condition, which is not true. Additionally, the name does not address the underlying pathophysiology and the syndromic nature of the condition.

Similarly, the term polycystic ovarian morphology (PCOM), which is a radiological description of the ovarian morphology, has been erroneously used as the term for the condition. A Follicle number per ovary (FNPO) ≥ 20 or a follicle number per section (FNPS) ≥ 10, or an ovarian volume (OV) ≥ 10 ml in at least one ovary in adults is considered the threshold for PCOM as per the recent international evidence-based guideline for the assessment and management of PCOS. Hence, this remains an imaging diagnosis, which comprises of only one of the diagnostic criteria for PCOS, and should not be used to refer to the condition per se.

As the widespread cardiometabolic and other systemic implications of the condition came into the limelight, the term polycystic ovarian syndrome (PCOS) was subsequently suggested. The term highlights the syndromic nature of the condition and has the potential to prompt the patients and the clinicians to think beyond the classical manifestations.

While this name does push for the pervasive nature of the disease, it still suffers from limitations. PCOS, being a clinically heterogenous condition, is characterized by the presence of one or more of the following clinical features: oligo-anovulation (OA) affecting 80-100%; polycystic-appearing ovarian morphology (PCOM) in 70-90%; hyperandrogenism (HA) in 50-100%; and metabolic dysfunction in 50-70% of patients. The diagnostic criteria proposed by prominent professional societies provide different weightage to each of these components in their respective definitions. While the Rotterdam 2003 criteria offer the broadest scope by giving equal weightage to the three primary abnormalities of OA, HA and PCOM (two out of the three required for diagnosis), the NIH criteria require the presence of both OA and HA, and the Androgen Excess-PCOS society definition has HA as a mandatory criterion, in addition to one of the remaining two for a diagnosis of PCOS. It is pertinent to note at this point that the term PCOS does not encompass any of these essential diagnostic criteria, nor does it address the underlying pathophysiological defects like insulin resistance.

The focus on polycystic appearance of the ovary in the term PCOStends to imply the ovarian cysts as the primary pathology, while they are merely an association. Secondly, the finding of ovarian cysts is not pathognomonic of PCOS and can be found in several medical conditions that closely mimic PCOS. Thirdly, persisting with a name that revolves around ovarian cysts is counterintuitive for public as well as physician perception of the disease as one centering around reproductive dysfunction, despite the inclusion of the term "syndrome". Patients can have excessive anxiety around ovarian cysts, which are occasionally perceived as tumors. In a cross-sectional survey involving 57 Australian women with PCOS, 47% of women incorrectly identified ovarian cysts as the key feature, 48% felt the current nomenclature is confusing and 51% felt the need for a change in the name. Similarly, of the 105 primary care physicians in the survey, 74% agreed that the name is confusing and 81% felt the need for a change to a name that is reflective of the broader clinical syndrome. Lastly, the focus on ovarian cystsalso potentially limits funding for research exploring the metabolic aspects of the condition.

Hence, it might be time to revisit the nomenclature for PCOS to arrive at a name which is reflective of the prominent classical features and the pathophysiological defects, easy to use and clear, non-stigmatizing and has a global appeal and equity value. There is some merit in using clinical phenotypes to describe the condition- classic PCOS (OA+HA+PCOM), ovulatory PCOS (HA+PCOM), and normo-androgenic PCOS (OA+PCOM). This eases the diagnosis by highlighting the reproductive clinical phenotype (most common presentation), and the risk of associated metabolic dysfunction (classic > ovulatory > normo-androgenic).

Alternatively, terms that encompass the underlying pathophysiological defects, like hyperandrogenic chronic anovulation, estrogenic ovulatory dysfunction have been suggested by some researchers. They did not have the backing of professional societies and were deemed general and non-specific. The new name should also have a prominent recall value. We suggest ECHO syndrome- Endocrine and cardiometabolic and hyperandrogenic overlap syndrome to highlight the multisystemic nature of the condition.

Any change in nomenclature requires the formation of a consensus of all the relevant stakeholders. The adoption of any new name in practice and scientific literature even after consensus building is a time taking process. Until that happens, the term PCOS, in comparison to other alternatives like PCOD or PCOM, still remains as the best bet for describing this ubiquitous condition.

DIAGNOSING PCO

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PCO is characterized by a combination of symptoms related to hormonal imbalance and metabolic issues. The condition often involves irregular menstrual cycles, elevated levels of androgens (male hormones such as testosterone), and polycystic ovaries. The exact cause of PCO remains unclear, but it is thought to involve genetic, environmental, and lifestyle factors.PCS is the diagnosis of exclusion.Several conditions can mimic PCO symptoms, so differential diagnosis is essential. The common differentials being:

a. Thyroid Disorders: Hypothyroidism or hyperthyroidism can affect menstrual cycles and cause symptoms like PCO.
b. Adrenal Disorders: Conditions like congenital adrenal hyperplasia or hypercortisolism can also lead to elevated androgen levels and symptoms like hirsutism.
c. Hyperprolactinemia: Elevated prolactin levels can cause menstrual irregularities and infertility.
d. Primary Ovarian Insufficiency: Premature ovarian failure can present with irregular periods and hormonal imbalances.

Diagnostic Criteria

The diagnosis of PCO is generally based on the Rotterdam criteria, which requires at least two of the following three features:

1. Oligo- or Anovulation: This refers to irregular or absent menstrual cycles. Women with PCOS may experience infrequent or skipped periods due to irregular ovulation. The definition of irregular cycles varies with age:

First year post menarche	Any pattern is not abnormal
1- <3 years post menarche	<21 or >45 days
≥ 3 years post menarche to Perimenopause	<21 or >35 days -or- <8 cycles per year
1 year post menarche	> 90 days for any 1 cycle
Primary amenorrhea by age 15 or > 3 years post thelarche	
Ovulatory dysfunction in regular cycles can be confirmed by measuring serum progesterone levels	

2. Hyperandrogenism: Elevated levels of androgens can lead to symptoms such as hirsutism (excessive male pattern hair growth), acne, and alopecia (thinning of hair). Hyperandrogenism can be assessed through clinical examination and laboratory tests measuring serum androgen levels. Standardized visual scales are to be preferred for grading clinical hyperandrogenism. Modified Ferriman Galleway scoring is to be used to grade hirsutism and a score of 4-6 is to be considered clinically significant. For male pattern hair loss Ludwig or Oslen grading needs to be used and as of now there is no universally accepted acne grading system. For assessing biochemical hyperandrogenism, Total Testosterone or Free testosterone levels are the initial tests of choice and preferably assessed by LC-MS/MS assays as compared to the immunoassay methods. Free testosterone assessed by calculation, equilibrium dialysis or ammonium sulfate precipitation methods can also be used. Values above the lab cut-off range for females is to be considered abnormal. If both are normal, then one can measure androstenedione and DHEAS again by preferably LC-MS/MS method over immunoassay methods. For the women who are already on OCPs, the tests need to be done after stopping the medications for at least 3 months.

3. Polycystic Ovaries: On ultrasound, the ovaries may appear enlarged and contain multiple small follicles, often described as a "string of pearls". Transvaginal ultrasound is preferred over abdominal ultrasound.The ultrasound parameters noted in PCOS are:

- FNPO (Follicle number per ovary)
- FNPS (follicular number per cross-section)
- Ovarian volume (OV)

Based on these observations, PCOS morphology is defined as:

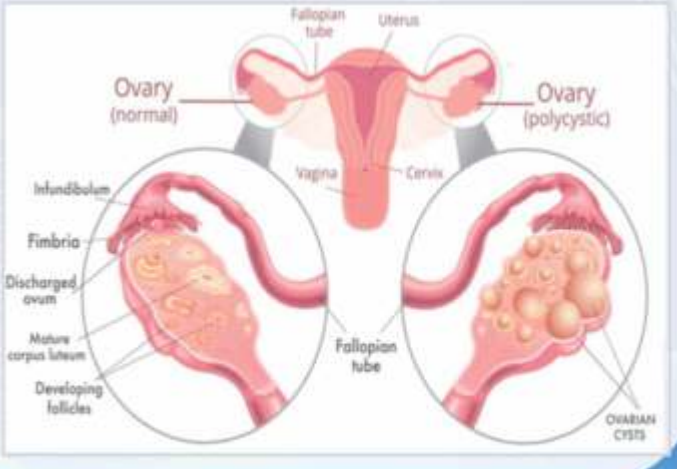
- FNPO: ≥ 20 in at least one ovary (determined by TVS)
- Transabdominal US is used to determine FNPS and OV
- ·FNPS ≥ 10 in at least one ovary and OV ≥ 10ml in at least one ovary

After thorough clinical, biochemical and ultrasound evaluation one can diagnose an individual to have PCOS if they have 2/3 of the above features.

Special scenarios:

Adolescents: Polycystic ovarian morphology can be normal in adolescent population. To diagnose them to have PCOS there should be both menstrual irregularity and clinical or biochemical hyperandrogenemia. If only one of the features is present then they are considered to be "at risk" and need to be reassessed again after reproductive maturity, i.e. after 8 years of menarche.

Menopause: Clinical and biochemical hyperandrogenism can persist beyond reproductive age and is a common differential for ovarian hyperthecosis and androgen-secreting tumors in this group of women.PCOS can be considered in these women if there is past diagnosis or if there is long term history of oligo-amenorrhea with hyperandrogenism and/or PCOM during the earlier reproductive years (20-40 years age).





ALL HIRSUTISM AND ACNE ARE NOT DUE TO PCO

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PCOD is the most common endocrine disorder encountered in reproductive age group women. Hirsutism and acne are the first and second most common manifestations of it. However, PCOD is a diagnosis of exclusion. Other important conditions that need to be ruled out and can mimic PCOD are:

- Non-classical CAH (4.3%)
- Cushing's syndrome
- Androgen secreting tumors (0.2%)
- Prolactin excess
- Idiopathic hirsutism (7.6 %)
- IDIOPATHIC HYPERANDROGENISM (15.8%)
- Hypertrichosis

But the major cause of androgen excess is PCOD (72.1%)

Fortunately, serious conditions like Cushing's syndrome and tumoral androgen excess are not common.

Non-classical CAH is ruled out if early morning 17-OHP levels drawn during the follicular phase are less than 2 ng/mL. However, if the levels are in the intermediate range between 2 and 10 ng/mL, an ACTH stimulation test will be needed. Clinically, there are some pointers to suspect non-classical CAH, such as a family history of hirsutism, high-risk ethnicity, history of consanguinity, and premature pubarche.

Cushing's syndrome is ruled out by performing a dexamethasone suppression test, 24-hour urinary free cortisol, and salivary cortisol levels.

Although a small rise in prolactin levels can be caused by PCOD per se, prolactin levels of more than 150 ng/mL with classical symptoms of galactorrhea and menstrual irregularities are suggestive of prolactinoma.

Tumor-causing androgen excess should be suspected when there is recent and rapid progression of features of androgen excess with total testosterone levels more than three times the upper limit of normal or >2 ng/ml. Virilization of recent onset and short duration warrants immediate investigation, even if serum total testosterone and DHEAS levels are only mildly elevated. Features of virilization include temporal balding, deep voice, muscular physique, loss of body contour, and clitoral enlargement. Ovarian tumors of androgen excess are more common than the adrenal causes.

Hirsutism may result from use of exogenous pharmacologic agents, including danazol (Danocrine), anabolic steroids, and testosterone. Oral contraceptives (OCs) containing levonorgestrel, norethindrone, and norgestrel tendto have stronger androgenic effects, while those with ethynodioldiacetate, norgestimate, and desogestrel are less androgenic.

Idiopathic (constitutional) hirsutism is characterized by excessive hair growth in the absence of elevated circulating androgen levels in ovulatory women. It occurs more frequently in certain ethnic populations, particularly in women of Mediterranean ancestry.

Hirsutism should be distinguished from hypertrichosis, in which the excessive hair growth is not restricted to androgen-dependent areas and comprises vellus or lanugo-type hair. Hypertrichosis is unlikely to be modified by the known treatments for hirsutism.

Even though acne is the second most presentation of PCO it is not considered a sensitive marker for hyperandrogenism. The other causes of acne include peripubertal increase in male hormones, familial hormonal triggers like menses, pregnancy particularly the first trimester and drug induced as with lithium, anti-epileptics and diet with high glycemic index.

Accurate diagnosis is key to effective treatment. A careful history taking with hormonal assessments, followed by the careful selection of imaging modalities, is crucial for successful treatment.



TREATMENT OF PCOS – WHY, WHEN AND HOW?

Dr. Sowrabha Bhat Dr. Akhila Bhandarkar Dr. Himamshu Acharya

PCOS is one of the most important endocrine disorders in women, affecting 7 to 15 % of those in the reproductive age group. It manifests in the form of a wide range of symptoms, including hirsutism, amenorrhea, oligomenorrhea, obesity, acne vulgaris and alopecia and is the predominant cause of infertility worldwide. Even after conception is achieved, PCOS predisposes the parturient to several adverse pregnancy outcomes, including a high risk of pregnancy-induced hypertension, spontaneous abortion, gestational diabetes, preeclampsia, and preterm birth, which increase the risks of stillbirth and neonatal death. Limited data suggests foetal growth abnormalities and an increased risk for future metabolic and reproductive dysfunction in the offspring of women with PCOS, but needs further research for confirmation. PCOS is also associated with a significantly increased lifetime risk of comorbidities, including type 2 diabetes mellitus, dyslipidaemia, metabolic-associated fatty liver disease, obstructive sleep apnoea, cardiovascular events and gynaecological cancers. Adolescent PCOS affects young women, beginning around 2 to 8 years post menarche and early treatment may result in some reversal of the metabolic abnormalities and restoration of overall preconception health. Contrary to the conventional belief that hyperandrogenaemia in PCOS may be protective against bone fragility, emerging research suggests that chronic inflammation, hyperinsulinemia and leptin resistance may adversely affect bone health and predispose these patients to osteoporosis. The incidence of depression in the PCOS population is higher as compared to the general population and significantly alters the quality of life of affected females.

Management of PCOS should be holistic addressing lifestyle, pharmacological, psychological and psychosexual aspects as well as considering the age, symptoms and concerns of the individual patient with

shared decision making.In adolescents with both hyperandrogenism and ovulatory dysfunction, pharmacological treatment can be considered. In adolescents at risk, although the focus is more on lifestyle modification, reassurance and follow up, pharmacological treatment may be considered in the presence of severe acne or irregular menses or bothersome clinical or biochemical hyperandrogenism. Associated issues of depression, anxiety, eating disorders and body image disorders need a team approach including psychiatrists and dieticians alongside endocrinologists. In adult patients with confirmed diagnosis, therapy consists of targeting lifestyle to reduce the associated metabolic risks and insulin resistance along with hormone therapy. If trying to conceive, preconception risk factors need to be optimised. Long term follow-up for complications related to endometrial hyperplasia and cancer needs consideration.

Lifestyle management: Lifestyle interventions are crucial for managing PCOS, with exercise and diet playing key roles. Healthy behaviours such as balanced eating and physical activity are useful. A minimum of 150–300 minutes of moderate-intensity exercise weekly should be advised with 60 minutes of moderate-rigorous exercise weekly in adolescents.

Combined Oral Contraceptive Pills (COCP): COCPs are recommended for adults and adolescents with PCOS to manage symptoms like hirsutism and irregular menstrual cycles. Evidence suggests that low-dose ethinylestradiol (<30 µg)is as effective as high-dose (≥30 µg) formulations. Progestin-only contraceptives may also be considered for endometrial protection.

Metformin: Metformin is particularly effective for adults with a BMI ≥ 25 kg/m². It can also be considered for a dolescents and adults with lower BMI, acknowledging limited evidence. Metformin is started at a low dose with 1-2 weekly increments of 500mg, the maximum dose being 2.5g in adults and 2g in adolescents.It may regularise menstrual cycles but with little effect on hirsutism.

Combination Therapies: While COCPs effectively manage hirsutism, metformin is preferred for metabolic concerns. The combined use of both may not offer significant additional benefits in lower-BMI individuals but may be beneficial for those at higher metabolic risk.

Anti-obesity Agents: Medications like GLP-1 receptor agonists can be considered alongside lifestyle interventions for weight management in higher-weight adults with PCOS.

Anti-androgen Therapies: These can be prescribed for hirsutism when COCPs or cosmetic therapies are insufficient. However, effective contraception is crucial to prevent potential risks during pregnancy. Spironolactone at 25-100mg/day has lower side effects. Higher doses of cyproterone acetate are associated with a risk of meningioma. Finasteride, flutamide and bicalutamide are associated with liver toxicity.
Inositol: While it may be considered based on individual preferences, with potential metabolic benefits but limited effect on hirsutism and ovulation.

Laser and Light Therapies for Hair Removal: These therapies can effectively reduce facial hirsutism and improve quality of life. More sessions may be needed for those with PCOS compared to other patients.

Psychological and psychosexual function: Screening for depressive and anxiety symptoms are essential in individuals with PCOS. A patient-centric approach should be used in management with discussions on body image, eating disorders and influencing factors. If symptoms are moderate to severe, they should be promptly referred.

IMAGING IN POLYCYSTIC OVARY SYNDROME (PCOS)

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The original description in 1985, defined polycystic ovary morphology (PCOM) as 10 or more follicles 2–8 mm in size in one cross-section of the ovary on transabdominal ultrasonography.

Trans vaginal imaging and the development ofhigher resolution trans-abdominalultrasound probes led to the introduction of more refined criteria in 2003 by Jonard et al, in which, follicle number per ovary threshold of 12 or more, measuring 2–9 mm in diameter (mean of both ovaries), had 75% sensitivity and 99% specificity in the diagnosis of PCOS.The 2003 Rotterdam criteria based their recommendation for PCOM on this study and recommended PCOM to be defined as either 12 or more follicles measuring 2–9 mm in diameter or an ovarian volume > 10 cm3 for either ovary.

Other measures used in the pastinclude the classic appearance of an increased number of follicles 2–9 mm in size, arranged in a peripheral distribution ("string of pearls" appearance), around a bright echo dense ovarian stroma. However, this morphology and other parameterssuch as stromal area, stromal echogenicity and follicular distribution have not been found to have significant predictive power in the diagnosis of PCOS, either when used alone, or when combined with follicle number and/or ovarian volume. These features were therefore excluded from the definition of PCOM in 2003 and by all major recommendations subsequently.

Using the proposed thresholds for PCOM by the 2003 Rotterdam criteria, 30–50% of otherwise normal women would have met the criteria for PCOM.Also, with progress in ultrasound transducer technology, a need for newer criteria was felt. In 2014, the Androgen Excess and PCOS (AEPCOS) society, updated thedefinition ofexisting PCOM. Theyrecommended increasing the threshold to >25 follicles per ovary and/or an ovarian volume threshold of >10 cm3,based on transvaginal ultrasound with a transducer frequency of 8 MHz or greater. Thisincreased threshold, however, resulted in the exclusionof a large group of oligo-anovulatory women and a group of women still at increasedrisk of metabolic dysfunction.In 2018, a slightly reduced follicle numberthreshold was proposed by the 2018 International Evidence Based Guidelines forthe Assessment and Management of PCOS, at >20 follicles per ovary and/or an ovarianvolume of >10 cm3.The 2018 recommendations definedPCOM,as: i) either >20 follicles per ovary and/or, ii) an ovarian volume of >10 cm3 on either ovary while ensuring there are no corpora lutea, dominant follicles or cystswhen using transvaginal ultrasound with a transducer frequency of 8 MHz or more.

The latest recommendations from the 2023 international evidence-based guidelines for the assessment and management of polycystic ovary syndrome further refined PCOM as

- Follicle number per ovary (FNPO) ≥ 20 in at least one ovary, and / or
- Follicle number per section (FNPS) ≥ 10 in at least one ovary and / or
- Ovarian volume ≥ 10 cm3 not including any cysts, dominant follicles, or corpora lutea

FNPO ≥ 20, measured by transvaginal ultrasound, of follicles between 2-9 mm in size, is the most accurate marker of PCOM in adults.
Ovarian volume ≥ 10 cm3 or follicle number per section (FNPS) ≥ 10 in at least 1 ovary in adults should be considered the threshold for PCOM

- when using a transabdominal ultrasound approach or
- if using older technology or
- image quality is insufficient to allow for an accurate assessment of follicle counts throughout the entire ovary.

There are no definitive criteria to define polycystic ovary morphology (PCOM) on ultrasound in adolescents; hence, these criteria are not recommended in adolescents. Pelvic ultrasound is not recommended for the diagnosis of PCOS within 8 years of menarche (gynaecological age of < 8 years), due to the presence of multi-follicular ovaries normally in this age group, which overlap with PCOM criteria in adults.

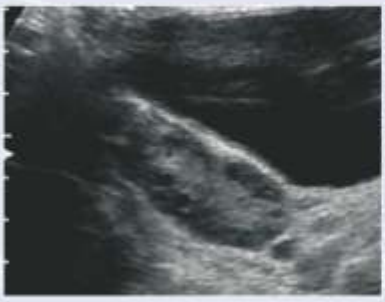

Fig 1: Transabdominal ultrasound image showing an enlarged ovary with a volume >10 cm3and multiple small (2-9mm) follicle numbering more than 10, suggesting PCOM.

Magnetic resonance Imaging (MRI) is not currently recommended in the diagnosis of PCOS/PCOM. However, findings may be incidentally detected during MRI performed for other indications. These findings are like those in ultrasound evaluation and include multiple small follicles that are hyperintense on T2 and hypointense on T1 imaging with prominent stroma, which appears as T1 intermediate signal and T2 low signal.

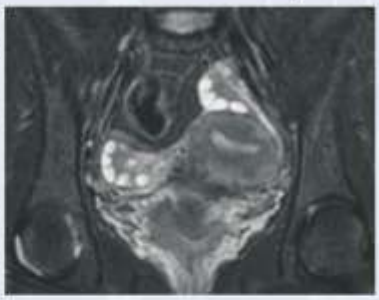

Fig 2: Coronal T2 MR of the pelvis - bilateral ovaries show multiple small uniform follicles, with prominent ovarian stroma, suggesting PCOM.

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POLYCYSTIC OVARY SYNDROME (PCOS): A DERMATOLOGICAL PERSPECTIVE

Polycystic Ovary Syndrome (PCOS) is a common endocrine disorder that affects 5-10% of women of reproductive age. Acne, hirsutism, and androgenic alopecia are among the most visible manifestations, leading many women to seek dermatological care as their first point of contact. Dermatologists, therefore, play a critical role in diagnosing and managing PCOS. Collaboration with endocrinologists is essential for comprehensive care, as dermatologists often treat the initial symptoms that prompt a diagnosis.

PCOS is primarily driven by an excess of androgens, which causes many of the condition's skin-related symptoms. These elevated androgen levels result in excessive oil production, unwanted hair growth, and scalp hair thinning.

Acne

Acne, particularly adult-onset acne, is a common dermatological presentation in PCOS patients. Unlike typical acne, which tends to appear during adolescence and affects the T-zone, PCOS-related acne often manifests along the jawline, chin, and upper back. Elevated androgen levels cause the sebaceous glands to produce more sebum, leading to clogged pores and inflammatory lesions.

To address this, dermatologists often prescribe hormonal treatments such as oral contraceptives to reduce androgen levels and regulate sebum production. Anti-androgen medications like spironolactone are also effective in reducing acne by targeting hormonal imbalances. Topical treatments, such as retinoids and benzoyl peroxide, are used to manage mild-to-moderate acne.

Hirsutism

Hirsutism, characterized by the excessive growth of dark, coarse hair in a male-pattern distribution (face, chest, and back), is another prominent symptom of PCOS. This excess hair growth results from increased androgen levels stimulating hair follicles.

Managing hirsutism involves hormonal therapies, including oral contraceptives with anti-androgen properties, such as cyproterone acetate. Spironolactone is also commonly prescribed to further reduce hair growth. For long-term hair reduction, dermatologists may recommend laser hair removal, which is extremely effective with the correct patient selection and significantly decreases hair growth over time. Given that hirsutism is a frequent initial complaint, dermatologists often serve as the first point of care, recognizing the need for further evaluation and referring patients to endocrinologists.

Androgenic Alopecia

Androgenic alopecia, or female-pattern hair loss, is a common but often distressing condition in women with PCOS. Elevated androgens cause hairthinning, primarily affecting the crown and frontal scalp while typically sparing the hairline.

Treatment options include topical minoxidil, which promotes hair regrowth, and oral medications such as spironolactone to block androgen activity. In severe cases, dermatologists may recommend cosmetic procedures like hair transplantation or scalp micro pigmentation.

Acanthosis Nigricans
Acanthosis nigricans, characterized by dark, velvety skin patches in body folds such as the neck, armpits, and groin, is closely associated with insulin resistance—a common feature of PCOS. Excess insulin stimulates skin cells to proliferate, resulting in hyperpigmentation.

Addressing acanthosis nigricans involves managing the underlying insulin resistance through lifestyle changes like weight loss and dietary adjustments. Topical treatments, such as retinoids or chemical peels, may help lighten affected areas, but these are secondary to treating the root metabolic cause

.

Dermatological Interventions and Comprehensive Care
Managing PCOS-related skin conditions requires a multifaceted approach. Hormonal therapies are essential for regulating androgen levels and reducing symptoms such as acne and hirsutism. Dermatologists also play a key role in addressing cosmetic concerns, offering treatments like laser hair removal and chemical peels to improve patients' self-esteem and quality of life.

Because dermatological symptoms, such as acne and hirsutism, are often the first indicators of PCOS, dermatologists frequently initiate early diagnosis. Collaboration with endocrinologists is crucial for addressing the systemic aspects of the condition, such as metabolic and reproductive issues. A multidisciplinary care model ensures that patients receive appropriate hormonal treatments while managing the visible symptoms that impact their quality of life.

Conclusion
PCOS is not only a reproductive and metabolic disorder but also a condition with significant dermatological implications. Acne, hirsutism, androgenic alopecia, and acanthosis nigricans are common symptoms that lead many women to seek help from dermatologists. As the first line of management, dermatologists are essential in recognizing these signs, providing treatments, and facilitating collaboration with endocrinologists to ensure comprehensive care. Through a combination of hormonal therapies and cosmetic interventions, dermatologists play a crucial role in improving both the physical and psychological well-being of women with PCOS.

POLYCYSTIC OVARIES: A GYNECOLOGIST'S PERSPECTIVE

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What began as a small report on Gynecological hormonal imbalance in 1935, PolyCystic Ovarian Syndrome (PCOS) has now assumed gargantuan proportions to involve other organs and specialties to become what it is today - an epidemic.

PCOS represents a significant challenge due to its multifaceted nature, impacting various aspects of a woman's health, from irregular menstrual cycles, through sub-fertility to pregnancy complications, metabolic health and delayed menopause. Thus women with polycystic ovaries present to a Gynecologist at anytimefrom puberty to after menopause.

From a gynecologist's perspective, one of the most significant aspects of PCOS is its impact on reproductive health. Many women with PCOS experience infertility due to anovulation. The chronic anovulation seen in PCOS leads to irregular menstrual cycles, making it difficult for women to conceive. Furthermore, even when ovulation occurs, the hormonal imbalances associated with PCOS can affect the quality of the oocyte and the endometrial milieu, further complicating conception.

In addition to infertility, PCOS is also associated with an increased risk of early pregnancy loss, gestational diabetes, and preeclampsia. These complications underscore the importance of early diagnosis and management of PCOS in women who are planning to conceive.

Psychological and Quality of Life Considerations
The psychological impact of PCOS cannot be emphasized on more. Women, especially adolescents and younger age groups with PCOS are more likely to experience anxiety, depression, and body image disturbances. The cosmetic concerns associated with hyper androgenism, such as hirsutism and acne, can contribute to significant emotional distress. Moreover, the challenges related to infertility can lead to feelings of inadequacy and low self-esteem.

As gynecologists, it is crucial to address these psychological aspects as part of a comprehensive management plan for women with PCOS. Providing counseling and support, along with appropriate medical and cosmetic treatments, can help improve the quality of life for these patients. Collaboration with mental health professionals may be beneficial for those struggling with significant psychological issues.

Treatment
For young women who are sexually inactive, progestogens for regulating cycles should be enough. More important is the need to emphasize the role of lifestyle modifications. In those not seeking pregnancy, hormonal contraceptives are often used to regulate menstrual cycles, reduce androgen levels, and protect the endometrium from hyperplasia. Anti-androgen medications can be used to manage hirsutism and acne. Weight management through lifestyle modification remains a central component of treatment for all women with PCOS, as even modest weight loss can significantly improve symptoms. For those women desiring a pregnancy, serial folliculometry identifies those needing ovulation induction medications like clomiphene citrate, letrozole, or gonadotropins. Women who are ovulating may not require these medications and must be encouraged to try. In some cases unresponsive to medications, assisted reproductive technologies (ART) such as IntrauterineInsemination (IUI) or in-vitro fertilization (IVF) may also be necessary.

Metformin, a biguanide that decreases production of glucose by the liver and improves body insulin sensitivity, is considered a gold standard for management of metabolic and anthropometric parameters in PCOS. However, their gastrointestinal side effects limit their use and the search is on for effective alternatives. Inositols are the current favoured contenders. They belong to the B- Complex group and function as insulin sensitisersand improve regularity of menstruation, carbohydrate metabolism and symptoms of hyperandrogenism. However, they have not yet been approved for routine use.

Regular follow-up is essential to monitor the effectiveness of treatment, manage emerging symptoms, and screen for associated conditions such as diabetes and cardiovascular disease. It is also important to remember that those women who continue to be obese stand a higher risk of having heavy perimenopausal bleeding due to endometrial hyperplasia and may subsequently develop endometrial cancer. Hence, they must undergo regular screening and be aware of potential complications.

Conclusion
Polycystic Ovary Syndrome is a complex and multifaceted condition that presents significant challenges in both diagnosis and management. From a gynecologist's perspective, a comprehensive approach that addresses the reproductive, metabolic, and psychological aspects of PCOS is essential. Early diagnosis, individualized treatment, and ongoing follow-up are crucial in mitigating the long-term health risks associated with PCOS and improving the quality of life for affected women. Given the lifelong nature of PCOS, patient education is key, and women should be empowered with the knowledge to manage their condition effectively throughout their lives.

PCOS – FROM THE DESK OF FERTILITY EXPERT

Dr. Rohitha, Consultant Gynaecologist & IVF specialist
Motherhood hospital, Hennur, Bengaluru

Polycystic ovarian syndrome is the most common endocrinological disorder of reproductive age women. Prevalence of PCOS is around 6-20% among reproductive age women and around 15-22% among infertile women. 75% of PCOS women suffer infertility due to chronic anovulation. Other factors supplementing include hyperandrogenism, endometrial pathologies, psychological issues and psychosexual factors. PCOS is associated with metabolic disorders and cardiovascular disorders on long term.

According to American society of Reproductive medicine (ASRM), evaluation of infertility in women with PCOS has to be started after 6 months of attempting conception with regular sexual intercourse.Approach to PCOS women with infertility should be holistic and aim to correct metabolic, endocrinological, psychological aspects apart from lifestyle and diet changes. Gut microbiota dysgenesis and inflammation is said to be altered in PCOS women. Catering to these issuescan give the women, maximum benefit in treatment of infertility and prevention of antenatal complications once they conceive later on. Prescribing oral contraceptives to infertile PCOS women are a big 'NO' as they do not solve the primary issue. Investigations of infertile couple in such cases should include tubal assessment and male factor evaluation. Blood sugars, thyroid profile and lipid profile need to be examined. Letrozole is the most common off-label oral drug prescribed for ovulation inductionand is associated with higher live birth rates than clomiphene citrate owing to its positive effects on endometrium. Clomiphene citrate has antagonist action on endometrium leading to thinning of endometrium and poor vascularity. However, a proportion of patients fail to respond to Letrozole alone which is when step up regimens are required. Most commonly used drugs for oral non-responders include exogenous gonadotropins, but they come with shortcomings of overstimulation, subsequent cycle cancellation, severe ovarian hyperstimulation syndrome (OHSS) or multiple pregnancies. Recently, few safer and efficacious options have been proposed and they include extended letrozole regimen, addition of insulin sensitizers like metformin and myo-inositol along with stimulation. Addition of insulin sensitizers is especially recommended in obese infertile PCOS women and is associated with higher ovulation and pregnancy rates compared to inducing agents alone. Addition of metformin also prevents OHSS. Some of the lean PCOS women do not respond to high dose of gonadotropins and are challenging to deal with. Lean PCOS women can be offered laparoscopic ovarian drilling which aims at destroying androgen rich stroma of ovary which probably potentiates action of FSH and promotes folliculogenesis. The action persists for three to six months post-surgery when we can try letrozole/extended letrozole or gonadotropin-based ovulation induction cycles. Although, it is associated with surgical risks it is proven to reduce the risk of ovarian hyperstimulation syndrome and multiple pregnancies.

Women with PCOS suffer from moderate-to-severe depressive and anxiety symptoms. Body image distress, low mood and eating disorders are highly prevalent and all these contribute to sexual dysfunction which might add to infertility. Quality of life in PCOS women is poor due to PCOS per se and associated comorbidities which prevails until the late reproductive years. But, on the brighter side, infertile women with PCOS have highest success rates oncethey receive proper treatment. PCOS women attain menopause at a later age which increases their fecundity beyond fourth decade of life. Indeed, recent studies have shown higher implantation rates and lower aneuploidy rates in women with PCOS undergoing IVF beyond 40 years compared to those without PCOS. Women with PCOS are at an increased risk of miscarriage, GDM, pregnancy-induced hypertension, and preeclampsia once they conceive. These complications are prevalent in the hyperandrogenic phenotypes and should be screened.

Awareness regarding lifestyle and diet helps alleviating the root cause and breaks the vicious cycle of insulin resistance and the syndrome. Inculcating right habits in young generation is crucial at this set point. Seeking help early mitigates contributing factors of ageing and egg quality which predicts the success of treatment for infertility in PCOS women. Mental health is underrated and should be catered in reproductive age population.

PCO – FROM THE DESK OF FERTILITY EXPERT...

Dr. Anupama Ashok, Fertility specialist,
Cloud Nine Hospital, Sahakaranagar, Bangalore.

Polycystic ovary syndrome is the most common endocrine disorder affecting women and the pre eminent cause of infertility.

Assessment of fertility
Reassurance that pregnancy can successfully be achieved either naturally or with assistance. BMI, BP & glycemic status (OGTT / HbA1c), routine preconception assessments (Rubella immunity, infection screen etc.), advice and supplementation of prenatal vitamins, semen analysis and tubal patency assessment. Healthy lifestyle encompassing healthy eating and regular physical activity should be recommended to limit adverse impacts on fertility and fertility treatment.

First line medical treatment
Letrozole should be the first-line pharmacological treatment for ovulation induction in infertile anovulatory women with PCOS.

Clomiphene citrate and metformin
The risk of multiple pregnancy is increased with clomiphene citrate use (alone or in combination with metformin) and therefore clomiphene

cycles will require stringent ultrasound monitoring. Clomiphene citrate combined with metformin could be used rather than clomiphene citrate alone to improve ovulation and clinical pregnancy rates.

Clomiphene citrate versus Letrozole
Letrozole should be used rather than clomiphene citrate to improve ovulation, clinical pregnancy and live birth rates. Current evidence demonstrates no difference in fetal abnormality rates between letrozole or clomiphene citrate ovulation induction or natural conception.

Second line medical treatment Gonadotrophins
Gonadotrophins alone or combined with clomiphene or letrozole could be considered. Expertise and intensive ultrasound monitoring are crucial .

Low dose step up gonadotrophin protocol should be used to optimize the chance of monofollicular development to avoid the risk of multiple pregnancy. Considerations here includes cancelling cycles when there is more than a total of two follicles greater than 14mm in diameter and advising avoidance of unprotected intercourse.

Live birth rate, clinical pregnancy rate per patient and ovulation rate per cycle are higher with gonadotrophins than with clomiphene citrate.

Laparoscopic ovarian surgery
When using laparoscopic ovarian surgery for ovarian drilling, the following should be considered:cost and expertise required for the safety,both intraoperative and postoperative risks, which are higher in women who are above healthy weight.

Third line medical treatment
In vitro fertilization and in vitro maturation
In the absence of an absolute indication for in vitro fertilization (IVF), Intracytoplasmic sperm injection (ICSI), IVF could be offered in women with PCOS and anovulatory infertility, if first or second line ovulation induction therapies have failed

The use of IVF is effective and when elective single embryo transfer is used, multiple pregnancies can be minimized.

Counselling prior to starting treatment about the increased risk of ovarian hyperstimulation syndrome and options to reduce the risk should be offered. **Gonadotrophin releasing hormone protocol** The use of a GnRH antagonist protocol for women with PCOS undergoing IVF/ ICSI is recommended as it enables the use of an **agonist trigger**, with the freezing of all embryos generated if required, without compromising the cumulative live birth rate, to **reduce the risk of significant ovarian hyperstimulation syndrome.**

Choice of follicle stimulating hormone: Either urinary or recombinant follicle stimulating hormone (FSH) could be used in women with PCOS undergoing (controlled) ovarian (hyper) stimulation for IVF/ICSI, with insufficient evidence to recommend a particular type of FSH preparation.

Exogenous luteinising hormone
Exogenous recombinant luteinising hormone (LH) treatment should not be routinely used in combination with FSH therapy.

Adjunct metformin
Adjunct metformin therapy could be used to reduce the risk of developing ovarian hyperstimulation syndrome and miscarriage.

In vitro maturation
Here, there is no risk of ovarian hyper stimulation syndrome but a lower cumulative live birth rate.

Dr. Afsar Fatima Dr. Santosh B
Bangalore Baptist Hospital

ADOLESCENT PCO, A DIFFERENT BALL GAME

Polycystic Ovary Syndrome(PCOS) is one of the most common endocrine disorders, affecting women of reproductive age, including adolescents (ages 10 to 19 years). Pathophysiology can begin early around adrenarche and persist until menopause, posing unique challenges in diagnosis and management.Understanding these differences in early stages is key to improving health outcomes for young women.

1. **Pathophysiology:** In addition to ovarian pathogenesis, hypothalamic dysfunction, neuropeptides, genetics-epigenetics, sympathetic overactivity and Insulin Resistance(IR), there is a role of GH-IGF-1-LH synergism causing ovarian thecal androgenesis.

2. **Overlap with Puberty:** During adolescence, many signs of PCOS - such as irregular menses, acne, and weight gain are similar to changes that occur during puberty.

   a) **Hirsutism:** Unlike Moderate to severe, milder and isolated forms may not indicate Hyper-Androgenism(HA) in early post menarcheal years. The commonly used modified Ferriman-Gallwey(mFG) score may not be suitable for adolescents (mFG ≥ 4-6 ideally), as adult terminal hair distribution can appear as late as 2 years after menarche.
   b) **Acne:** Transient and milder lesions typically occur in adolescence, but moderate to severe(≥10), inflammatory, cystic, especially non-responsive to topical therapy, if combined with other features like androgenic alopecia may need evaluation for PCOS, hyper-androgenic conditions.
   c) **Oligo-Anovulation(OA):** irregular menstrual cycles are common atleast 1-2 post-menarcheal years, may even persist till 5th year in few cases. Of which, upto 85% are anovulatory during 1st year, 59 %(3rd year), upto25% till 6th year.
   d) **Onset of menarche** also widely varies from 9 to 16 years. Disturbed gonadotropin secretion and follicle growth arrest result in a later age at menarche, whereas small for gestational age(SGA), higher bodyweight, chromosome-6 rs7759938-T variant, have an early age of menarche.
   e) **Polycystic Ovary Morphology(PCOM):** Multiple follicles, volume >10 cc is not uncommon in 2menarcheal years. Therefore, revised criteria suggest mean ovarian volume 12cc or single ovarian volume 15cc or 2SD above mean in the healthy adolescent populationto avoid over-diagnosis. Further, constraints of trans-vaginal over trans-abdominalultrasoundreduces accuracy.

3. **Progression of Symptoms:** In adults, the symptoms of PCOS are usually more established,whereas inconsistent in adolescents. Irregular menses, acne might resolve over few years, androgen levels fluctuate throughout puberty, hence needing a critical follow up.

What's new in terms of Diagnosis?
1. Improved Diagnostic Criteria:Thetraditional Rotterdam Criteria used in adultsis not fully applicable. Newer guidelines recommend delaying a definitive diagnosis until two years after menarche.

Following are recommendations (Ibáñez et al.Horm Res Paediatr)

Required	Optional[2]	Not recommended[3]	Comments
1. Irregular menses/ oligomenorrhea 2. Evidence of hyperandrogenism a. Biochemical b. Clinical (e.g., progressive hirsutism)	1. PCOM 2. Severe cystic acne	1. Obesity 2. Insulin resistance 3. Hypertriglyceridemia 4. Biomarkers (e.g., AMH, T/DHT ratio) 5. Acanthosis nigricans	1. Must generally be 2 years post-menarche 2. Must rule out other disorders of hyperandrogenism (e.g., NC-CAH, Cushing syndrome)

PCOS, polycystic ovary syndrome; PCOM, polycystic ovarian morphology; AMH, anti-Müllerian hormone; T/DHT, testosterone to dihydrotestosterone; NC-CAH, non-classical congenital adrenal hyperplasia. [2] These criteria are often used in concert with the required criteria, but should not be used independently as diagnostic features. [3] These criteria have been associated with PCOS but are not diagnostic.

For those who have features but do not meet diagnostic criteria, an "at risk" could be considered and reassessment advised at or before full reproductive maturity (post menarche 3 years(OA), 8 years(PCOM)).

2. **Newer insights into Androgen Excess:** Elevated androgen levels are a hallmark of PCOS. But lack of established norms, fluctuating levels during anovulatory cycles and while on combined oral-contraceptive pill(COCP), lower assay reliability, interferences act as a barrier. Preferring biochemical measures- free testosterone, calculated free-testosterone,free androgen index(FAI), Dehydro-epiandrostero nesulfate (DHEAS), A4 (Androstenedione) is still a matter of clinician's choice.

3. **Biomarker:** Serum AMH(anti-mullerian hormone) not considered usefuldue to weaker association, others like T/DHT ratios, specific proteins or microRNA are not yet validated.

4. Other PCOS **mimics** to be looked for:

Feature	Differentials
Hyperandrogenaemia	Ovarian and Adrenal neoplasms, congenital adrenal hyperplasia (e.g.:NCCAH), Cushing's, ovarian hyperthecosis, drugs
OA, Insulin resistance (IR), Obesity	young onset diabetes, IR syndromes, hypothyroidism, hyperprolactinemia

What is crucial in management of adolescent PCOS?
Management involves combination of lifestyle interventions, medication, and psychological support. There is a need to avoid use of inconsistent non-evidence-based management among allied professionals

1. **Focus on Metabolic Health:** Unlike adults, adolescents may less likely manifest metabolicconsequences- IGT, type 2 diabetes, OSA, cardio-vascular disease and obesity.Hence adolescence is critical period for early identification and intervention. Recent studies emphasize the metabolic aspects and need for early lifestyle modifications, including balanced nutrition, exercise, which are now being recommended first-line.
2. **Long-term reproductive Implications:** Future fertility aspects, reproductive life plan and age-appropriate education on optimizing reproductive health has to be discussed. risk of developing endometrial hyperplasia and cancer should be addressed.
3. **Weight and physical development:** Adolescence is an age of overall physical development. Due to underlying weight gain and insulin resistance, drugs (COCP) there may be at a higher risk of obesity, body composition changes.Hence at-least 60 minutes of moderate- to vigorous-intensity physical activity per day, including activities that strengthen muscle and bone at least three times per week.
4. **Medications:**

Metformin ± COCP	Cycle regulation
Cosmetic (for at least 6 months) – prior to drugs	Hyper-androgenism

Recommended are – COCP ± metformin (max dose-2g) to those with clear diagnosis and "at risk". Valuing personal preferences, natural oestrogen or progestins with lowest possible doses, and off-label prescription of anti-androgens (approached with more caution) in adolescents (limited evidence). Clinicians need to monitor the long-term effects of these medications on adolescent growth and development.

5. **Mental Health Considerations:** PCOS is associated with higher rates of anxiety, depression, body image concerns, eating disorders, feeling isolated or confused by their symptoms, more so during the vulnerable phase - adolescence. Research has emphasized on mental health support as a key part of the treatment. Holistic approaches with mental health professionals alongside endocrinologists to provide comprehensive care, addressing both the physical and psychological aspects of the condition should be the standard.

Conclusion
Though there's lack of extensive data, the understanding of adolescent PCOS is evolving, and new research is helping to fine-tune the diagnosis and management. While the symptoms may overlap with normal puberty, early identification and tailored interventions serve as a window of opportunity to prevent future impact on reproductive and metabolic and smoothen transition to adult-care. Through continued research and personalized care, the medical community is better equipped than ever to support adolescents with PCOS.



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POLYCYSTIC OVARY : A COMPREHENSIVE OVERVIEW OF LONG-TERM HEALTH IMPLICATIONS

While traditionally known for its effects on fertility and menstrual irregularities, recent research reveals that PCOS is associated with a wide array of long-term health risks, including metabolic disorders, cardiovascular disease (CVD), liver disease, and psychological issues. This article offers an in-depth examination of these risks and highlights new insights drawn from recent studies.

Cardiovascular Disease and PCOS: New Findings
Recent data from the UK Biobank provides fresh insights into the cardiovascular risks associated with PCOS. Women with PCOS have a significantly higher risk of developing cardiovascular disease (CVD), including heart failure and acute coronary syndrome, regardless of traditional risk factors like body mass index (BMI) or lifestyle choices. Specifically, the study indicated that women with PCOS had a 76% increased risk of developing all-cause CVD compared to controls matched for age and BMI. This heightened risk was seen across different subtypes of CVD, such as atrial fibrillation and cerebrovascular accidents, underscoring the importance of early cardiovascular monitoring in women diagnosed with PCOS.

However, it's worth noting that the increased risk for cardiovascular events may vary depending on the phenotype of PCOS. Women with normoandrogenic PCOS showed a higher risk of CVD compared to their hyperandrogenic counterparts. This surprising finding suggests that androgen levels may play a protective role against heart disease in some women, although the underlying mechanisms remain unclear.

Metabolic Dysfunction: Beyond Diabetes
While insulin resistance and type 2 diabetes have long been associated with PCOS, new findings suggest an additional risk for Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD), previously known as non-alcoholic fatty liver disease (NAFLD). Women with PCOS are more likely to develop MASLD, independent of obesity or other common metabolic risk factors. In the UK Biobank study, 35.9% of women with PCOS exhibited hepatic steatosis (excess liver fat), compared to 23.9% of controls. This condition can progress to more severe liver damage, including fibrosis and cirrhosis, if left unchecked.

The study also found that hyperandrogenic PCOS patients are at a greater risk of liver fibro inflammation, as indicated by higher corrected T1 values on MRI, a marker of liver inflammation. This suggests that increased liver fat deposition in PCOS is not merely a consequence of obesity but might be directly related to hormonal imbalances.

Mental Health: The Psychological Burden of PCOS
Women with PCOS face significant mental health challenges, with elevated rates of anxiety, depression, and body image issues compared to the general population. The psychological toll can be attributed to both

physical symptoms, such as weight gain, acne, and hirsutism, as well as the emotional distress of dealing with infertility and chronic health issues.

According to recent studies, around 16% of women with PCOS report symptoms of depression or anxiety, a figure notably higher than in non-PCOS women. These mental health issues can further exacerbate metabolic and cardiovascular risks, creating a vicious cycle. Healthcare providers should adopt a more holistic approach to PCOS management, ensuring that mental health support is integrated into treatment plans.

Hormone-dependent Cancers: Revisiting the Risks

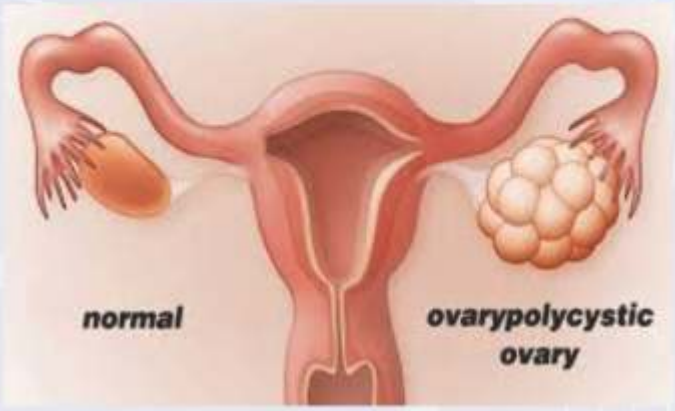
PCOS has been linked to an increased risk of hormone-dependent cancers, particularly endometrial cancer, due to prolonged unopposed oestrogen exposure in women with chronic anovulation. However, the link between PCOS and other cancers, such as breast and ovarian cancer, remains less clear. In the UK Biobank study, women with PCOS were found to have a higher incidence of hormone-dependent cancers, but the association disappeared after adjusting for traditional risk factors like obesity and smoking. This suggests that while PCOS may increase the likelihood of certain cancers, the elevated risk may not be as pronounced as previously thought once lifestyle factors are accounted for.

Emerging Concerns: Dementia and Cognitive Decline

Although less well-established, there is growing interest in the potential link between PCOS and cognitive decline. While the UK Biobank study did not find a significant association between PCOS and all-cause dementia, some smaller studies have indicated that women with PCOS may experience alterations in brain structure and function, which could predispose them to cognitive issues later in life. Further research is needed to clarify this relationship, but early intervention to control metabolic and cardiovascular risk factors may help mitigate any potential cognitive risks.

The importance of PCOS phenotyping

One of the most important recent advancements in PCOS research is the recognition that PCOS is not a one-size-fits-all condition. Subtyping women with PCOS based on their androgen levels—hyperandrogenic versus normoandrogenic phenotypes—provides critical insights into disease progression and risks. For example, hyperandrogenic women are



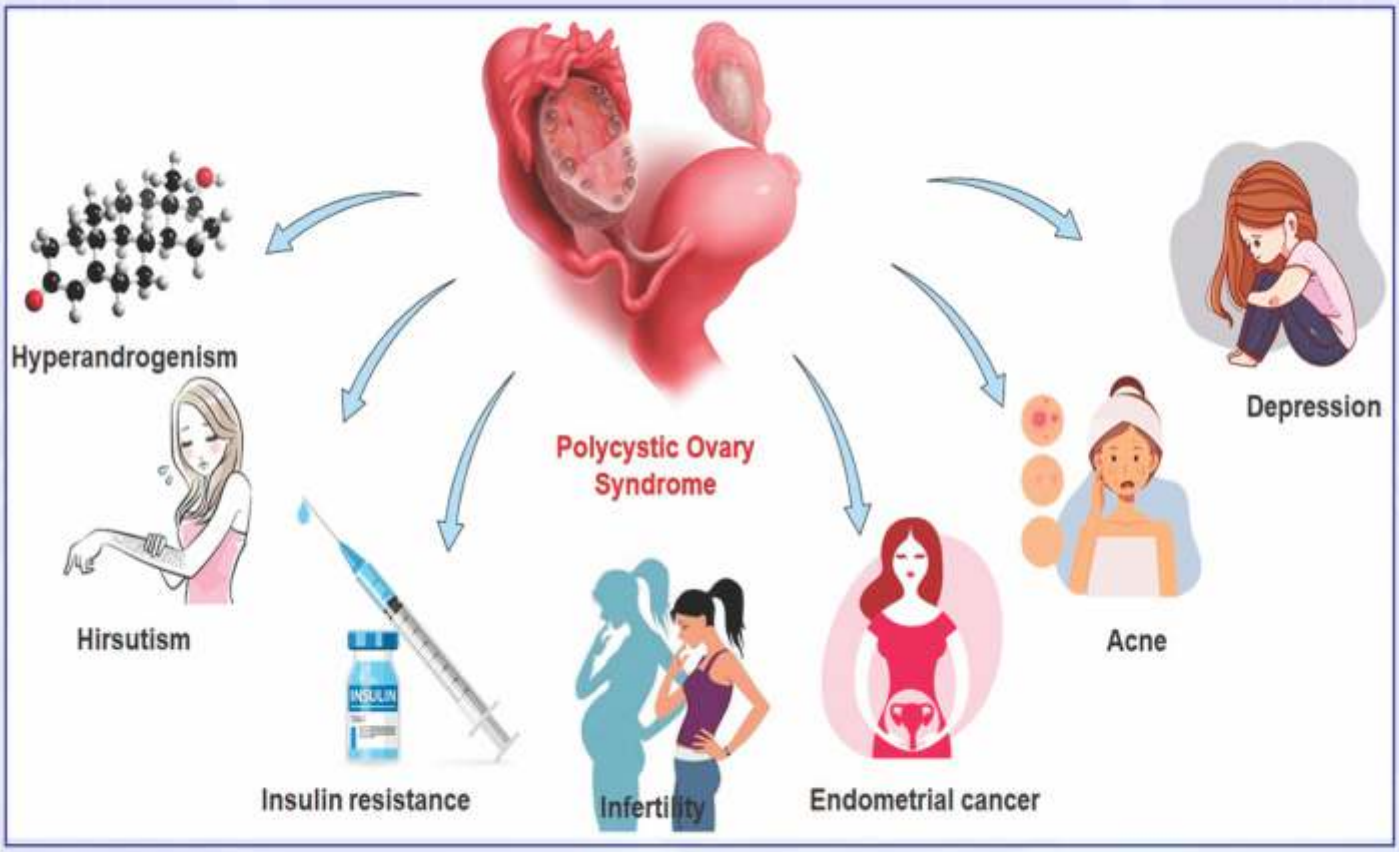
more likely to develop liver disease but appear to have a lower risk of cardiovascular events. Conversely, normoandrogenic women may be at higher risk for CVD but have fewer liver-related complications.

This phenotypic differentiation emphasizes the need for personalized medicine approaches in treating PCOS. Rather than a blanket treatment strategy, healthcare providers should tailor interventions based on a woman's specific PCOS phenotype and associated risks.

Conclusion: A Multisystem Disease Requiring Comprehensive Care

PCOS is much more than a reproductive disorder; it is a multisystem condition that affects a woman's long-term health in numerous ways. The increased risk of CVD, diabetes, liver disease, and mental health issues requires a comprehensive, multidisciplinary approach to care. Regular screening for metabolic and cardiovascular risks, along with mental health support, should be standard practice for women with PCOS.

As research continues to uncover the complex interactions between hormones, metabolism, and cardiovascular health, clinicians must remain vigilant in their management of women with PCOS, ensuring that treatment is both proactive and personalized. By addressing these long-term risks early, we can help improve the quality of life for women living with PCOS and reduce the burden of chronic disease.



Society Activities

A health awareness programme "Chankum Karalum' focusing on heart, diabetes and liver was conducted by Dr Vageesh Ayyar, Endocrinology and Dr Jyothi Idiculla, Internal Medicine at Mary Matha Church, Koramangala, Bangalore.

There are some photos of our activities for the last 3 months

Physical Programmes done last 3 Months

1. MVJ CME
2. Christ College - Public Awareness
3. Church Patient Awareness
4. Sridevi Medical College CME

Online Public Awareness Programmes done last 3 Months

1. Growth n puberty
2. PCOS
3. Gestational Diabetes
4. Prediabetes
5. Thyroid

7th Annual Conference

Secretariat
Prof. Belinda George, Hon. Secretary, Department of Endocrinology, St. John's Medical College Hospital, Kormangala, Bengaluru 560034.