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Course 482

Polycystic Ovary Disease

Objectives

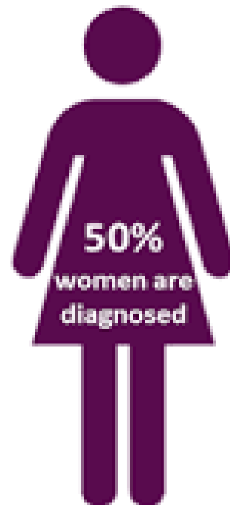
- Describe the Pathogenesis of PCO
- Identify the clinical picture of PCO
- List the investigations required to diagnose PCO
- List the health hazards associated with PCO
- Describe the management options of PCOS

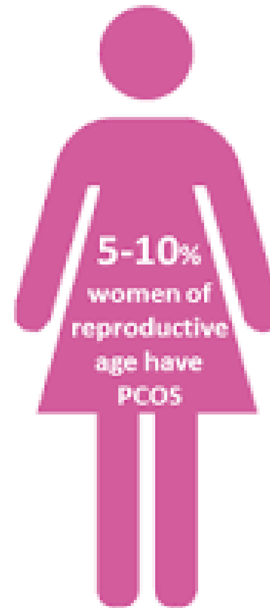
PCOS

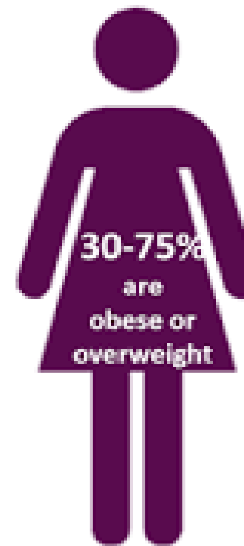
- PCOS= Polycystic ovarian syndrome
- It is a set of symptoms caused by Anovulation and Elevated Androgens in women
- It is due to a combination of genetic and environmental factors
- It is the most common endocrine disorder amongst women between 18-44 years old.
- It affects approx. 2%-20% of this age group.
- It is one of the leading causes of poor fertility.

PCOS

PCOS FACTS AND NUMBERS







www.LifeWithPCOS.co.uk

PCOS - Pathophysiology

- Women with PCOS have abnormalities in the metabolism of androgens and estrogen and in the control of androgen production.
- Although the exact etiopathophysiology of PCOS is unclear, it can result from abnormal function of the hypothalamic-pituitary-ovarian (HPO) axis.
- The biochemical features of PCOS:
  1. Raised androgen production (e.g: *testesterone, androstenedione*, and *dehydroepiandrosterone sulfate (DHEA-S*)
  2. Individual variation is considerable, and patients might have normal androgen levels.

3. Peripheral insulin resistance causing hyperinsulinemia, and obesity amplifies the degree of both abnormalities.

4. **Anovulation** and **elevated androgen level** is due to increased level of luteinizing hormone (LH) secreted by the interior pituitary

↓

stimulations of the ovarian theca cells

↓

increase androgen production (testosterone & androstenedione)

Decreased level of follicular-stimulating hormone (FSH) relative to LH

↓

lack of aromatization of androgens to estrogens

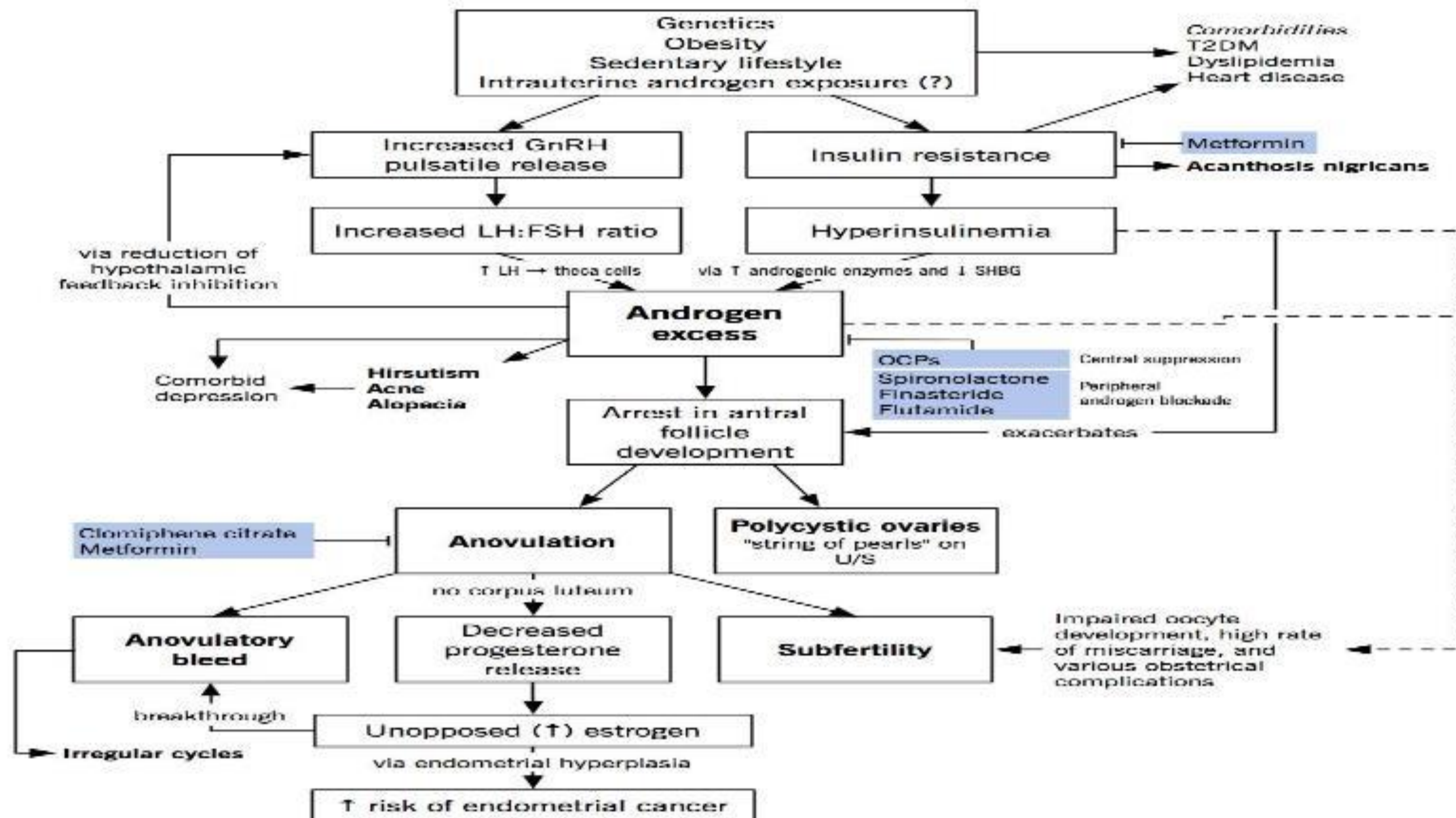
↓

decreased estrogen levels and hence anovulation

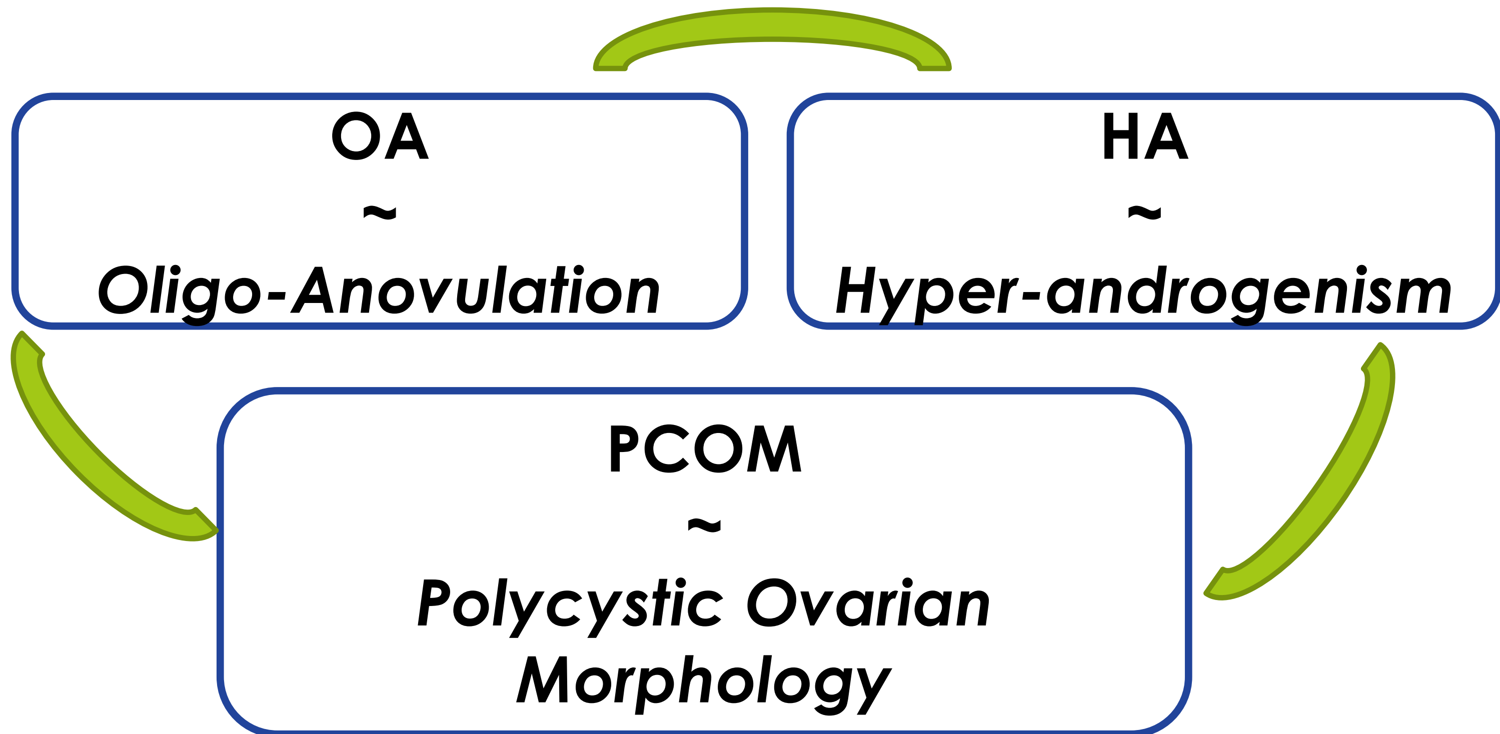
5. Polycystic ovaries are enlarged bilaterally and smooth thickened capsule. On cut section, subcapsular follicles in various stages of atresia are seen at the periphary, with hyperplasia of theca stromal cells.

6. PCOS is a genetically heterogeneuos syndrome, however the genetic contributions remain incompletely described. Studies of family members with PCOS indicate that an autosomal dominant mode of inheritance occurs for many families with the disease.

PATHOPHYSIOLOGY



PCOS



Signs and symptoms

- Menstrual dysfunction (amenorrhea, oligomenorrhea, menorrhagia)
- Anovulation
- Signs of hyperandrogenism (Hirsutism, acne, hair fall)
- Infertility
- Obesity and metabolic syndrome
- Obstructive and sleep apnea

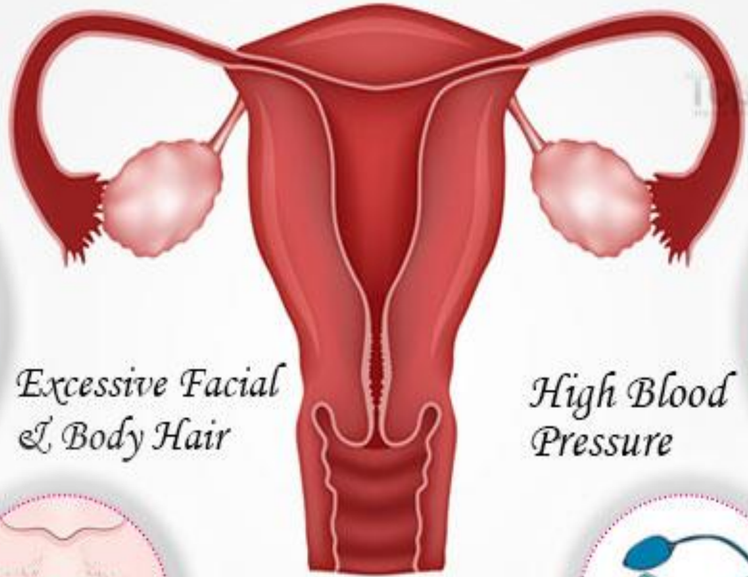
OA:Oligo-Anovulation

- Primary / Secondary Amenorrhoea
- Oligomenorrhoea
- Less than 8 episodes of menses a year
- Cycle length exceeding 35 days (*n:21-35*)
- Complications PCOM diagnosis on US > No longer recommended in the presence **OA**

10 Signs & Symptoms of POLYCYSTIC OVARY SYNDROME (PCOS)

Irregular Periods

Acne



Absence of Menstruation

Weight Gain

Excessive Facial & Body Hair

High Blood Pressure

Hair Thinning & Loss

Depression

Abnormal Skin Discoloration

Stress

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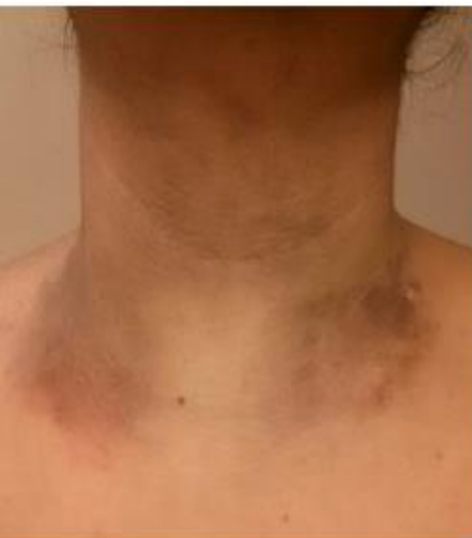
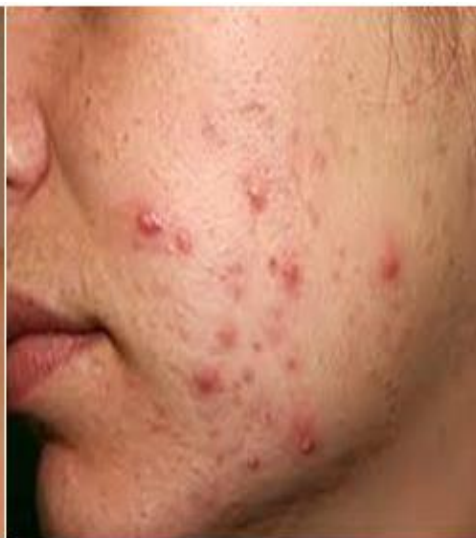
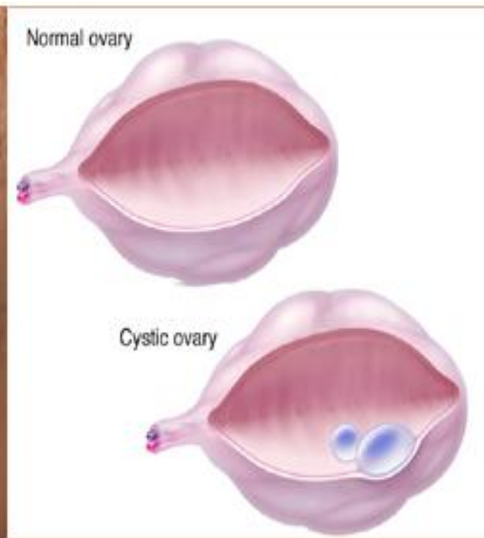
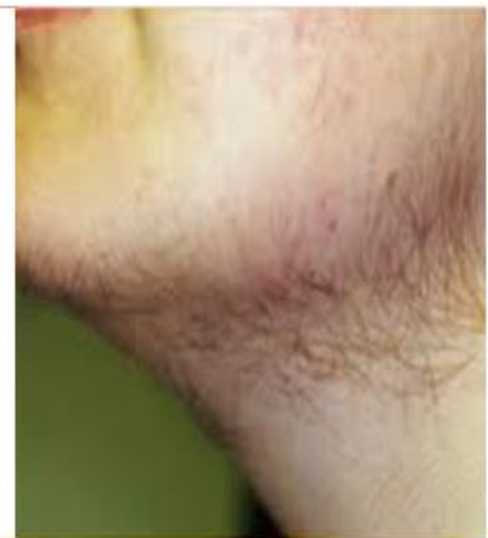



Normal ovary
Cystic ovary


Diagnosis

- **On examination, findings in women with PCOS:**
  1. Virilizing signs
  2. Acanthosis nigricans
  3. Hypertension
  4. Enlarged ovaries (may or may not be present)

Testing/Investigations

Exclude other disorders that can result in menstrual irregularities and hyperandrogenism:

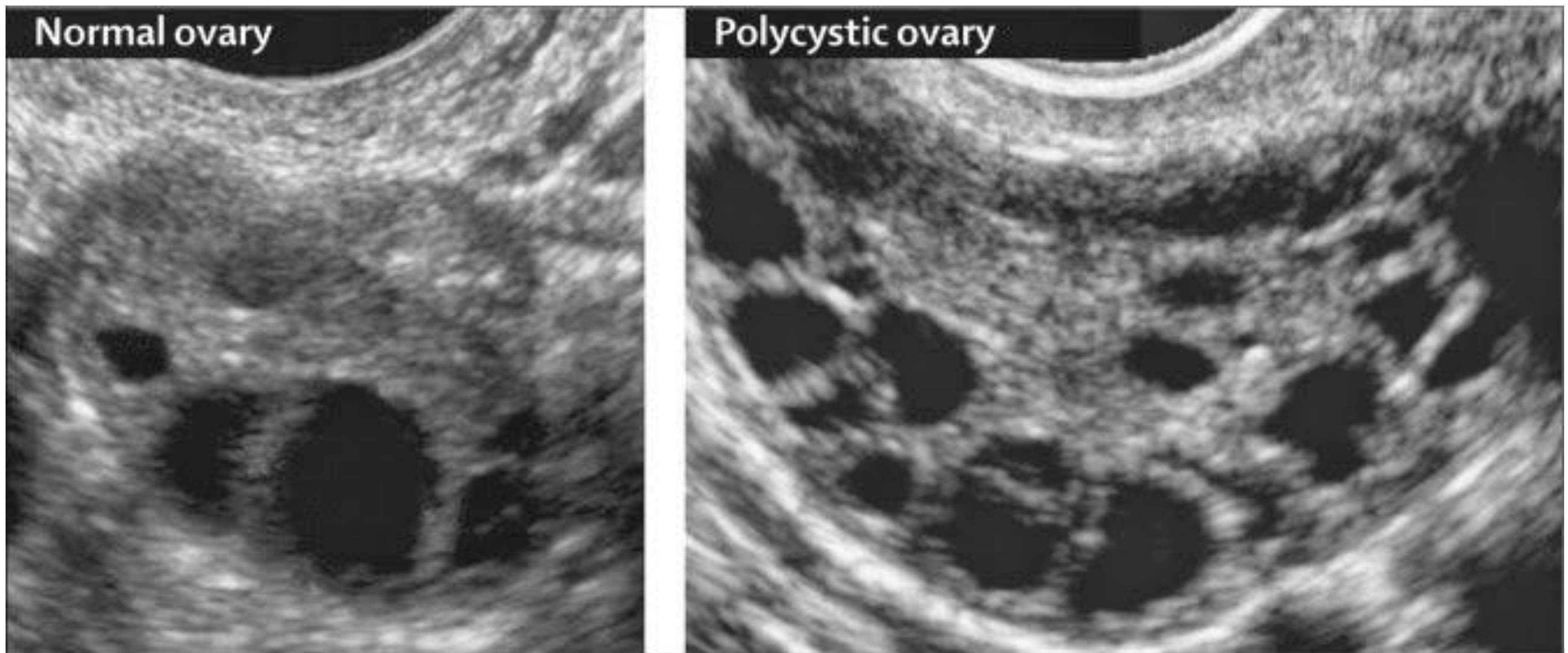
- Adrenal tumors
- Ovarian tumors
- Thyroid dysfunction
- Congenital adrenal hyperplasia
- Hyperprolactinemia
- Acromegaly
- Cushing syndrome

Diagnosis

- Screening labs studies for PCOS:
  - Thyroid function tests (TSH, free thyroxine)
  - Serum Prolactin level
  - Total and free testosterone levels
  - Free androgen index
  - Serum hCG level

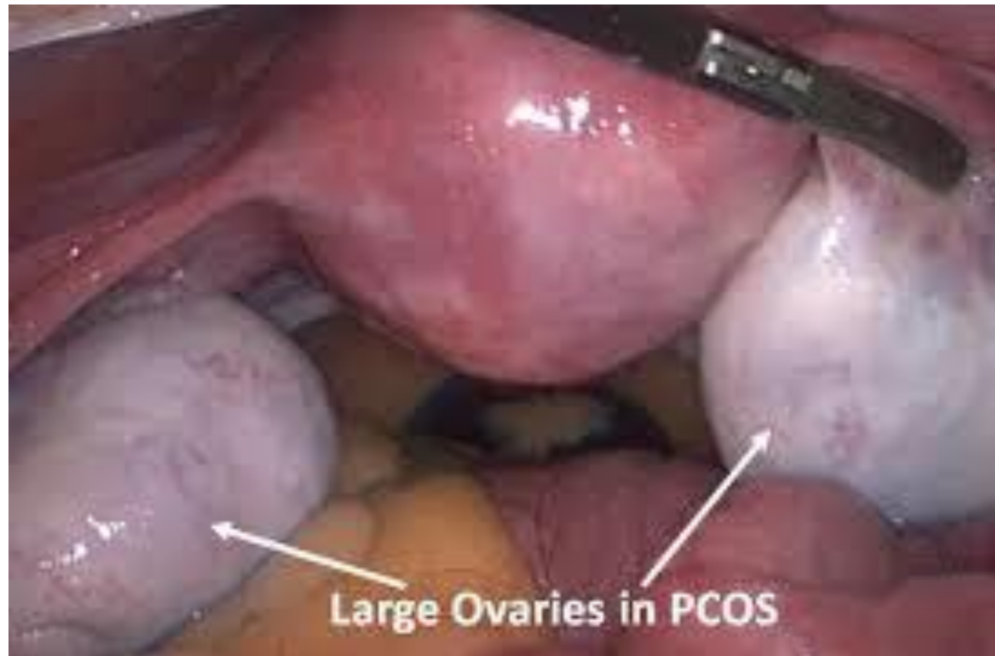
- Other tests:
  - Androstenedione level
  - FSH and LH levels
  - GnRH stimulation levels
  - Glucose level
  - Insulin level
  - Lipid level

- Imaging tests:
  - Ovarian ultrasonography, preferably using transvaginal approach
  - Pelvic CT scan or MRI to visualize the adrenals and ovaries



Procedures

- Ovarian biopsy for histologic confirmation of PCOS
- Ultrasonographic diagnosis of PCOS
- Endometrial biopsy to evaluate for endometrial disease (malignancy)



Health hazards/Prognosis

- Increased risk for cardiovascular and cerebrovascular disease
- Elevated serum lipoprotein levels similar to those of men
- Approx. 40% of patients with PCOS have insulin resistance hence increased risk of type 2 diabetes and cardiovascular complications.
- Increased risk for endometrial hperplasia and carcinoma (chronic anovulation in PCOS leads to constant endometrial stimulation with estrogen without progesterone, and this increases the risk of endometrial hyperplasia and carcinoma)

Management of PCOS

1. **Life style modifications**= first-line treatment

- Diet
- Exercise
- Weight loss

MULTI-DISCIPLINARY TEAM

Gynaecologist

Dietician

Physician/Endocrinologis
t

Fertility Specialist

Support Groups

2. Pharmacotherapy

=treat metabolic derangments (anovulation, hirsutism, and menstrual irregularities)

- First-line medical therapy is oral contraceptive pills (OCP)

→ induce regular menses (eg ethinyl estradiol, medroxyprogesterone

- Androgen blocking agent (eg spironolactone, leuprolide, finasteride) → treat hirsutism
- Clomiphene citrate or letrozole =selective estrogen receptor modulators → for ovulation induction, as a first-line treatment
- Hypoglycemic agents (metformin, insulin)

- Topical hair-removal agents (eg eflornithine)
- Topical acne agents (eg benzoyl peroxide, tretinoin topical cream (0.02-0.1%)/gel (0.01-0.1%)/solution (0.05%))

3. Surgery

=aim to restore ovulation

Method → Laproscopically:

- Electrocautery
- Laser drilling
- Multiple biopsy