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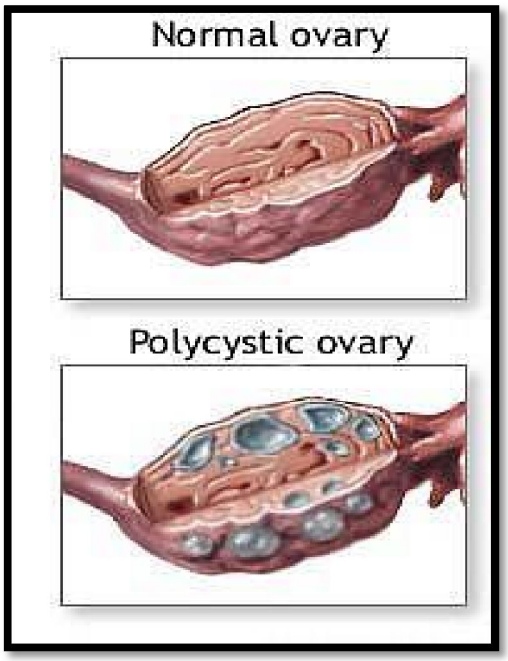
OLYCYSTIC OVARIAN SYNDROME (PCOS)

- **Formation of multiple small cysts in ovaries**
- **Affects 5-10% of women**

(Or even higher: 20% in some popula□ons)

- **A major cause of infertility in women**



- Ovarian cancer less than cystic
- When the ovary gains cyst its ability to ovulate and produce hormones diminishes significantly to the point that the woman might not be able to conceive
- The exact cause is unknown
- It syndrome with insulin resistance : may improve to diabetes – there is no action of insulin in peripheral tissue so , pancreas work as much as could then in cretins point an not work any more →
- Then diabetes type 2 will develop

Associated with:

(we might consider it as a risk factor). These are not causes! But they might be associated with it

- **Insulin resistance (in 50% of pa□ents) → Glucose intolerance**
- **excessive androgen production (very common)**
- **Hyperlipidemia → Obesity (40% of cases)**
- **Chronic anovulation → Menstrual disorders**

- **Hypersecretion of leutinizing hormone (LH) and androgens → - Hirsutism - Hypertension and Obesity**

  - **Exact cause of the syndrome: is unknown**

➢ **May be multifactorial:**

✓ **Genetic factors and**

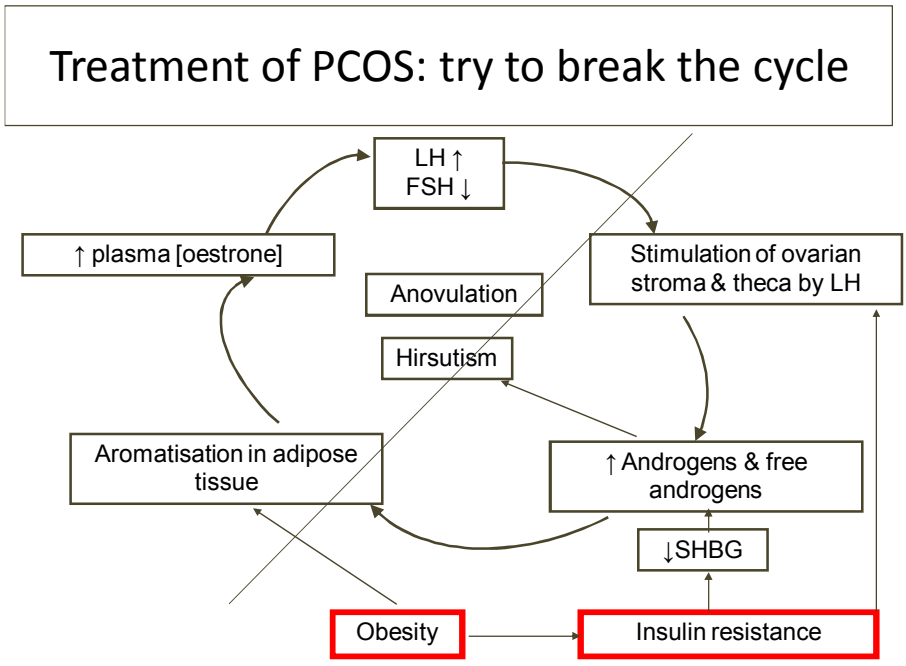
✓ **Environmental factors**

➢ **Abnormalities in ovaries, and adrenal & pituitary glands are also observed**

Diagnosis done by measuring: **measuring hormones in blood and ultrasound , why ultrasound? Because many patients have symptoms but no cysts**

- **Free testosterone *(total testosterone is less sensitive than free testosterone, androgens often increase in PCOS)***
- **Sex hormone-binding globulin *(SHBG; often decreases in PCOS → tends to↓ [total testosterone]& ↑ [free testosterone]***
- **Leutinizing hormone *(LH; ↑ in 60% of cases)***
- **Follicle stimulating hormone *(FSH; often normal in PCOS)***
- **LH/FSH Ratio *(↑ in > 90% of pa□ents)***
- **Fasting glucose**
- **Insulin**
- **Lipids**
- **Ovarian ultrasound:**
  - ✓ **30% of pa□ents do not have ovarian cysts despite having symptoms**

- **Androgen in general is high**
  ***if we can test total good but the free more sensitive b/c SHBG in this patient. Decrease that cause increase in free testosterone which a more specific lab diagnoses**
- **In obesity :**
  Aromatize that convert testosterone to estrdiol increase in the plasma that what cause normal FSH
- **Adipokine:**
  1- in peripheral tissue cause insulin resistance
  2- Stimulation of the ovary that increase androgen in blood that precipitate in the adipose tissue then convert it to estradiol



Treatment on PCOS :

Aim: interrupt the previous cycle

(Obesity, insulin resistance, excess androgens…)

- **↓ [LH] with oral contracep□ves**
- **↓ weight**
- **↑ [FSH] with clomiphene, etc**
- **Estrogen replacement therapy in select women after careful risk counseling**

Select women: are females that proved to not have any diathesis for developing diseases related to estrogens (like cancer)

Ovarian cancer

- **A leading cause of death from gynecologic cancer (in USA)**
- **Results from malignant transformation of ovarian epithelial cells *(Most common type of ovarian cancer*)**

Subtypes:

- **Serous (46%): surface epithelial tumors**
- **Mucinous (36%): mucinous epithelial tumors**
- **Endometrioid (8%): endometrial tumors**

Other types of ovarian cancer:

- **Sex cord tumors**
- **Stromal tumors**
- **Germ cell tumors**

Risk factors

- **Nulliparity *(woman with no child birth or pregnancy)***
- ***Even" abortion "***
- **Family history of ovarian cancer**
- **Family history of breast, ovarian, endometrial, or colon cancer *(may indicate a familial cancer susceptibility syndrome)***
- **Mutations in BRCA1 and BRCA2 genes are the most common inherited ovarian cancer susceptibility syndrome.**
- **Carriers of BRCA1 muta□ons have a risk of ovarian cancer approaching 44%**
- **Premenopausal breast or ovarian cancer indicates higher risk for hereditary ovarian or breast cancer**
- **Ashkenazi Jews: have higher risk of ovarian cancer**

Biomarkers and diagnosis

Biomarkers and diagnosis

- Epithelial ovarian cancer is commonly diagnosed at a later stage
- Due to non-specific symptoms such as abdominal pain, bloating, early satiety, nausea, etc...
- Most pa□ents (75%) have advanced-stage tumor upon diagnosis

Diagnosis includes:

- History taking " imp " with family h
- Physical examination
- Ultrasound
- Determination of serum CA-125 levels

Cancer antigen 125 (CA-125)

- The only serum marker of epithelial ovarian cancer
- A cell surface glycoprotein expressed in epithelium of all tissues
- Normally absent in serum
- CA-125 is elevated in ovarian cancer
- >35 U/ml is considered posi□ve
- Recommended as an annual test for women with family history of ovarian cancer
- CA-125 correlates with ovarian cancer stage
- Elevated in:
  - ✓ 50% of pa□ents with stage I
  - ✓ 90% of pa□ents with stage II

- ✓ CA-125 is the only marker , and its raise in the blood is proportional to the number of cancer cells
- ✓ CA-125 is normally expressed by epithelial cells but is never found in serum
- ✓ it is not specific , not sensitive but it is the only one we can found it in cretins level due to destroying of old epithelial cell
- ✓ One rising level not indicate like when it gradually rising

- ✓ >90% of pa□ents with stage III and IV

Cancer antigen 125 (CA-125)

It is not specific enough:

- False positive CA-125 conc. are found in benign condi□ons:
  - Endometriosis
  - Uterine leiomyoma
  - Pelvic inflammatory disease
  - During the first trimester of pregnancy and in menstrual cycle
  - During menstruation
- Some pa□ents (< 50 years) have elevated CA-125 due to unrelated malignant mass

CA-125 is not a marker of choice for ovarian cancer screening in asymptomatic individuals due to:

- Low prevalence of ovarian cancer
- High false-positive rate

Useful in:

- Monitoring chemotherapy
- Monitoring success of surgery (de-bulking procedures)
- Annual testing for women with family history of ovarian cancer