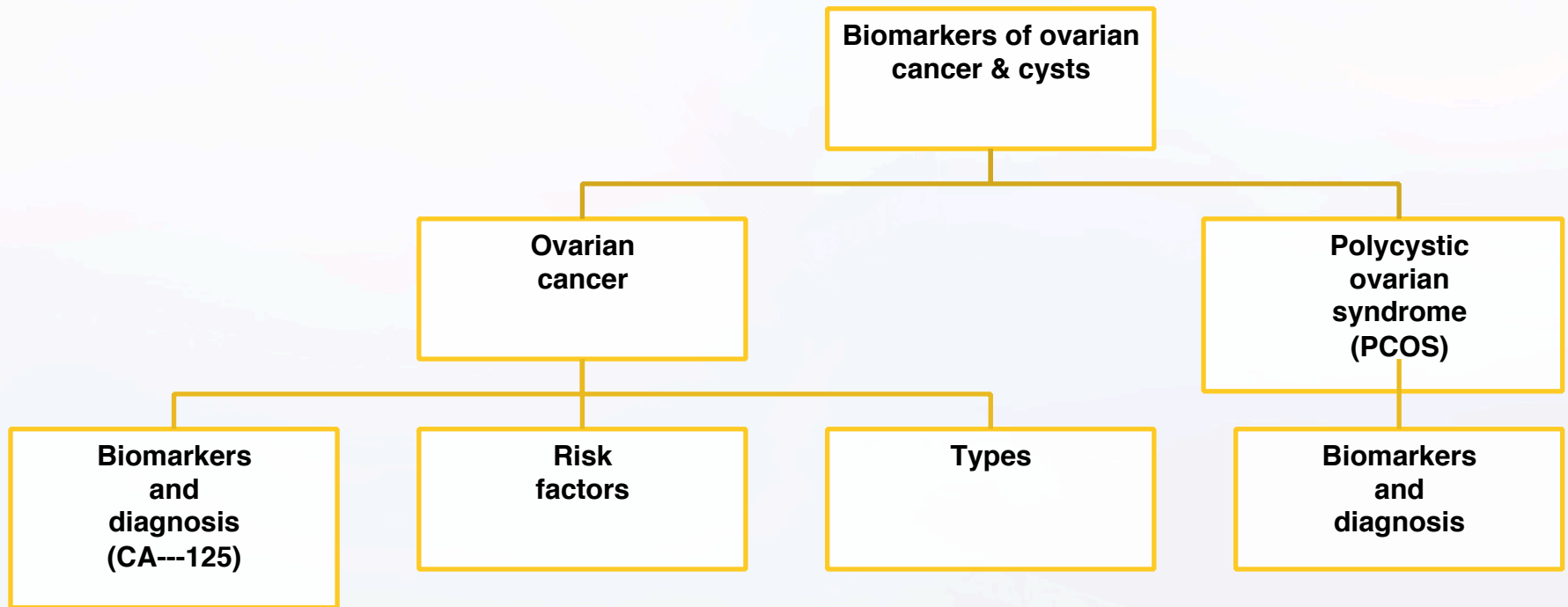




## L3\_ Biomarkers of ovarian cancer and cysts

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# MIND MAP



# Polycystic ovarian syndrome ( PCOS)

- ❖ Formation of multiple small cysts in ovaries
- ❖ Affects 5-10% of women (or even higher: 20% in some populations)
- ❖ A major cause of infertility in women

## Associated with:

**Obesity** (40% of cases)

Hirsutism

**Chronic anovulation**

Glucose intolerance

**Hyperlipidemia**

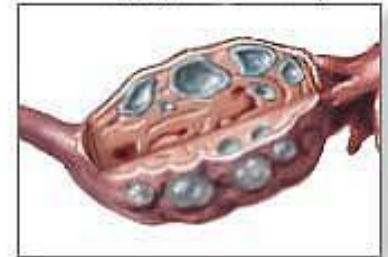
Hypertension

**Menstrual disorders**

Normal ovary



Polycystic ovary

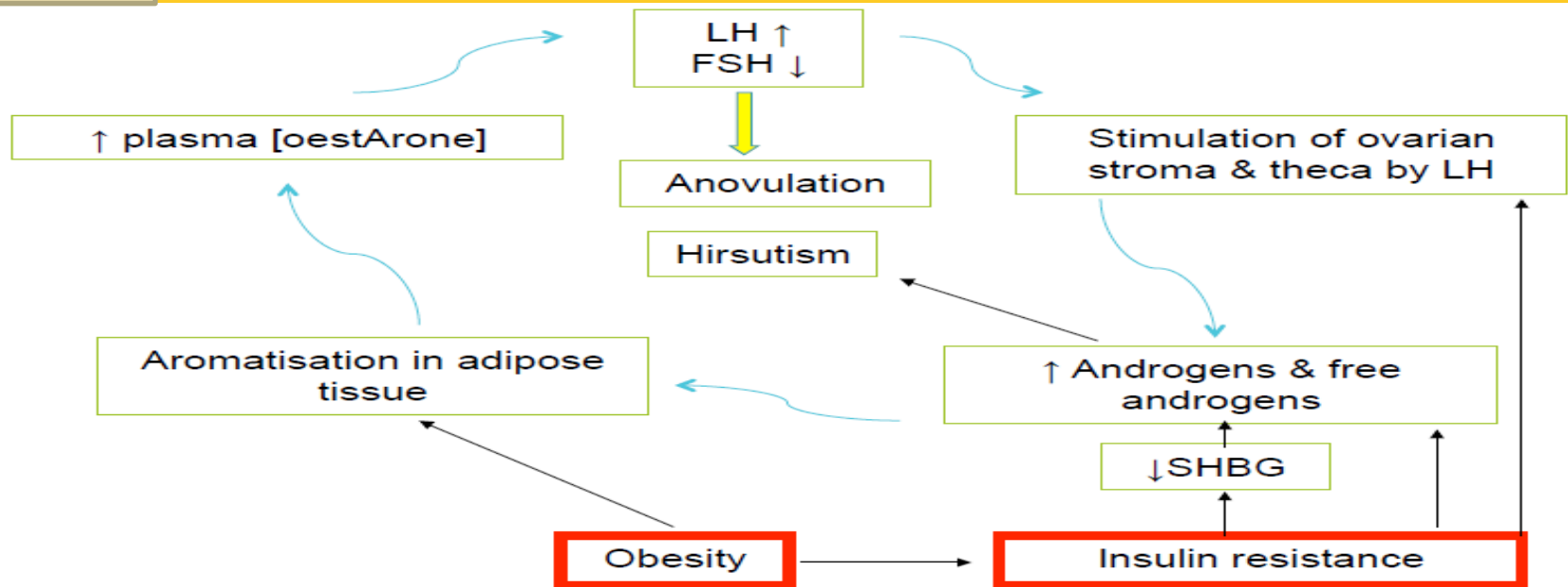


## Hormonal Changes:

- Hypersecretion of leutinizing hormone (LH) and androgens (TESTOSTERONE)
- Low level of Sex hormone-binding globulin (SHBG)

# Biochemical, metabolic & endocrine changes in PCOS

From 432 team



The European Society for Human Reproduction and Embryology (ESHRE) and the American Society for Reproductive Medicine (ASRM) recommended that:

at least 2 of the following 3 features are required for PCOS to be diagnosed:

Oligo-ovulation or anovulation manifested as oligomenorrhea or amenorrhea

Hyperandrogenism (clinical evidence of androgen excess) or hyperandrogenemia (biochemical evidence of androgen excess)

Polycystic ovaries (as defined on ultrasonography)

# Polycystic ovarian syndrome, continued...

Exact cause of the syndrome is unknown.

❖ **May be multifactorial:**

- Genetic factors
- Environmental factors

❖ **Suggested causes:**

- Insulin resistance (in 50% of patients) and excessive androgen production are very common
- Abnormalities in ovaries, adrenal & pituitary glands

## □ **Diagnosis Done By:**

### 1) **Measuring the following**

- Free testosterone (Androgens Often increase in PCOS)
- Sex hormone--binding Globulin )often Decreases In PCOS)
- FSH (normal or decreased), LH (Increased )
- Fasting glucose, insulin, Lipids

### 2) **Ovarian Ultrasound:**

- 30 %Of Patients Do Not Have Ovarian Cysts Despite Having symptoms

## □ **Treatment:**

**Aim:** interrupt the previous cycle (obesity, insulin resistance, excess androgens...)

- ↓ **Weight**
- ↓ [LH] with oral contraceptives
- ↑ [FSH] with clomiphene , etc
- Estrogen replacement therapy in select women after careful risk counseling

# 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
- ✓ Sex cord tumors
- ✓ Stromal tumors
- ✓ Germ cell tumors

## Risk factors

- Nulliparity (woman with no child birth or pregnancy)
- Family history of ovarian ,breast,, endometrial, or colon cancer.
- Mutations in BRCA1 and BRCA2 genes
- Carriers of BRCA1 mutations (have a risk of ovarian cancer approaching 44%)
- Premenopausal breast or ovarian cancer (indicates higher risk for hereditary breast or ovarian cancer)
- Ashkenazi Jews (have higher risk of ovarian cancer)

# Ovarian cancer, continued...

## 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 patients (75%) have advanced-stage tumor upon diagnosis

## Diagnosis includes:

1. History taking
2. Physical examination
3. Ultrasound
4. 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 the epithelium of all tissues)
- ❑ **Normal ovarian epithelial cells do not express CA-125**
- ❑ **Normally absent in serum**
- ❑ CA-125 is elevated in ovarian cancer ( >35 U/ml is considered positive)
- ❑ **Recommended as an annual test for women with family history of ovarian cancer**
- ❑ CA-125 correlates with ovarian cancer stage.

<i>Elevated in:</i>	<i>False positive CA-125 conc. are found in benign conditions:</i>	<i>Useful in:</i>
<ul style="list-style-type: none"><li>• <b>50% of patients with stage I</b></li><li>• <b>90% of patients with stage II</b></li><li>• <b>&gt;90% of patients with stage III and IV</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Endometriosis</b></li><li>• <b>Uterine leiomyoma</b></li><li>• <b>Pelvic inflammatory disease</b></li></ul> <p><b>ALSO DURING (1<sup>st</sup> trimester of pregnancy and during menstruation)</b></p> <p><b>Some patients (&lt; 50 years) have elevated CA-125 due to <u>unrelated malignant mass</u></b></p>	<ol style="list-style-type: none"><li><b>1. Monitoring chemotherapy</b></li><li><b>2. Monitoring success of surgery (de-bulking procedures)</b></li><li><b>3. Annual testing for women with family history of ovarian cancer</b></li></ol>

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**



# Summary

	Polycystic ovarian syndrome	Ovariain cancer
Predisposing factors	Obesity, Diabetes, Hypertension,	Nulliparity, family history & BARCA mutation
Sign & symptoms	Hirsutism, menstrual disorder	Abdominal pain, blotting & early satiety
Biochemical marker	↑ Testosterone & LH ↓ SHBG & FSH	↑ CA-125 > 35 U/ml
Note about biochemical marker	- High testosterone levels are caused by insulin-resistance.	- Low prevalence of ovarian cancer - High false-positive rate - Good in monitoring
Treatment	Estrogen replacement	–

# MCQs

**1. Polycystic ovarian syndrome is associated with hypersecretion of:**

- A. FSH
- B. SHBG
- C. LH
- D. A and B

**2. Due to non-specific symptoms (abdominal pain, blotting, ETC), which of the following is diagnosed at later stage:**

- A. Breast cancer
- B. PCOS
- C. Ovarian cancer

**3. The only serum marker of epithelial ovarian cancer is:**

- A. CA-125
- B. CD34
- C. CA-199

**4. Ashkenazi Jews have a higher risk for:**

- A. Breast cancer
- B. PCOS
- C. Ovarian cancer

**5. CA-125 is considered positive in ovarian cancer when:**

- A. More than 45 U/ml
- B. Less than 45 U/ml
- C. More than 35 U/ml

**6. False positive CA-125 conc. are found in :**

- A. PCOS
- B. Endometriosis
- C. Ovarian cancer

**7. CA-125 is not a specific marker for ovarian cancer due to:**

- A. High prevalence of ovarian cancer
- B. There are better ovarian markers
- C. High false-positive rate

**8. CA-125 is good for:**

- A. Following up
- B. Staging
- C. Success of surgery
- D. All of above

**1-C 2-C 3-A 4-C 5-C 6-B 7-C 8-D**

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ختاما ،،

نتمنى أن يكون اجتهادنا على مدار العام قد حاز على رضاكم .. فما كان من صواب فبتوفيق من الله وما كان من تقصير فمن أنفسنا .. دعواتنا للجميع بالتوفيق في الدارين