DIAGNOSIS OF PCOS

FLAME LECTURE: 208

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Learning Objectives

- Describe associated symptoms and physical examination findings of amenorrhea and oligomenorrhea
  - Establish the diagnostic criteria for PCOS
  - Understand the limitations of the features used to diagnose PCOS
- Discuss the steps in the evaluation and management of amenorrhea and oligomenorrhea
- Prerequisites:
  - NONE
- See also – for closely related topics
  - FLAME LECTURE 109: Treatment of PCOS
  - FLAME LECTURE 107: Oligomenorrhea
  - FLAME LECTURE 110: Presentation of Androgen Excess
  - FLAME LECTURE 111: Treatment of Androgen Excess

EPIDEMIOLOGY

- Polycystic Ovarian Syndrome affects 8-13% of reproductive age women worldwide[1]
- It is the single most common endocrine abnormality of reproductive age women
- However, note that women can have "polycystic ovaries" on US if they have good ovarian reserve w/o having a diagnosis of PCOS!

EPIDEMIOLOGY

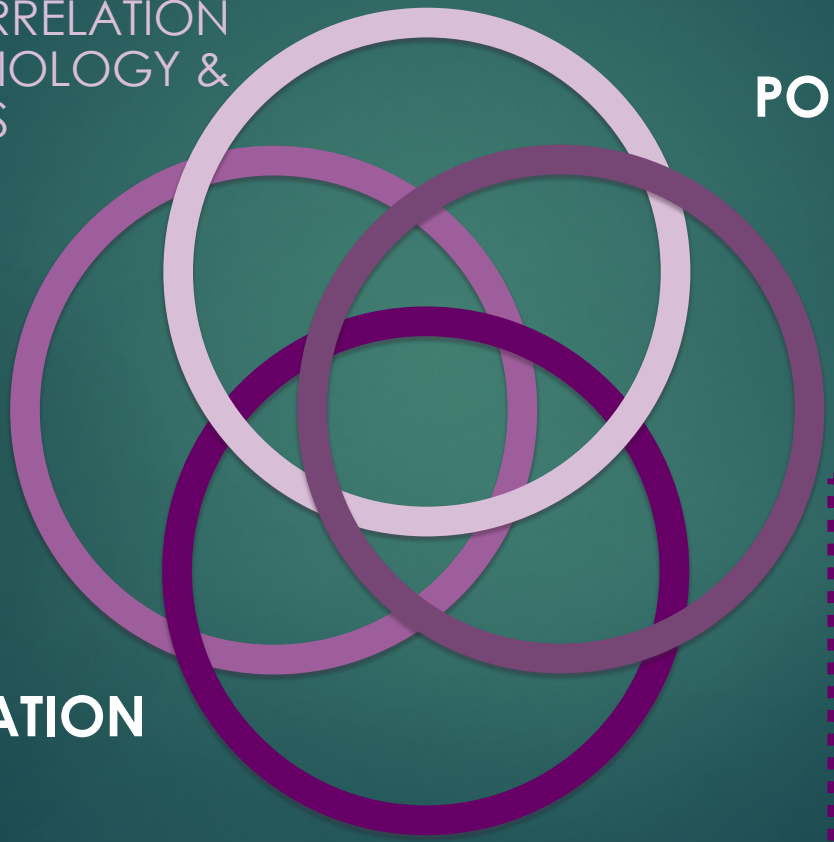
- While PCOS can effect fertility, there are also a number of pregnancy-related complications:
  - 20-40% higher SAB rate above baseline[2]
  - Increased risk of gestational DM (OR 3.4)[3]
  - Increased risk of gestational HTN (OR 3.4)[3]
  - Increased risk of preeclampsia (OR 2.2)[3]
  - Increased risk of preterm birth (OR 1.9)[3]
  - Increased risk of NICU admission (OR 2.3)[3]

THE BIG FOUR CLINICAL FEATURES

COMPLEX INTERRELATION OF PATHOPHYSIOLOGY & CLINICAL SIGNS

POLYCYSTIC OVARIES

HYPER-ANDROGENISM & HIRSUTISM



INSULIN-RESISTANCE

OLIGO-OVULATION

Morbidity caused by PCOS does NOT occur in a step-wise fashion! Multiple pathologic processes are causing mayhem simultaneously!

THE BIG FOUR FEATURES ARE CAUSED BY THE BIG TWO (…IN RED & BLUE)

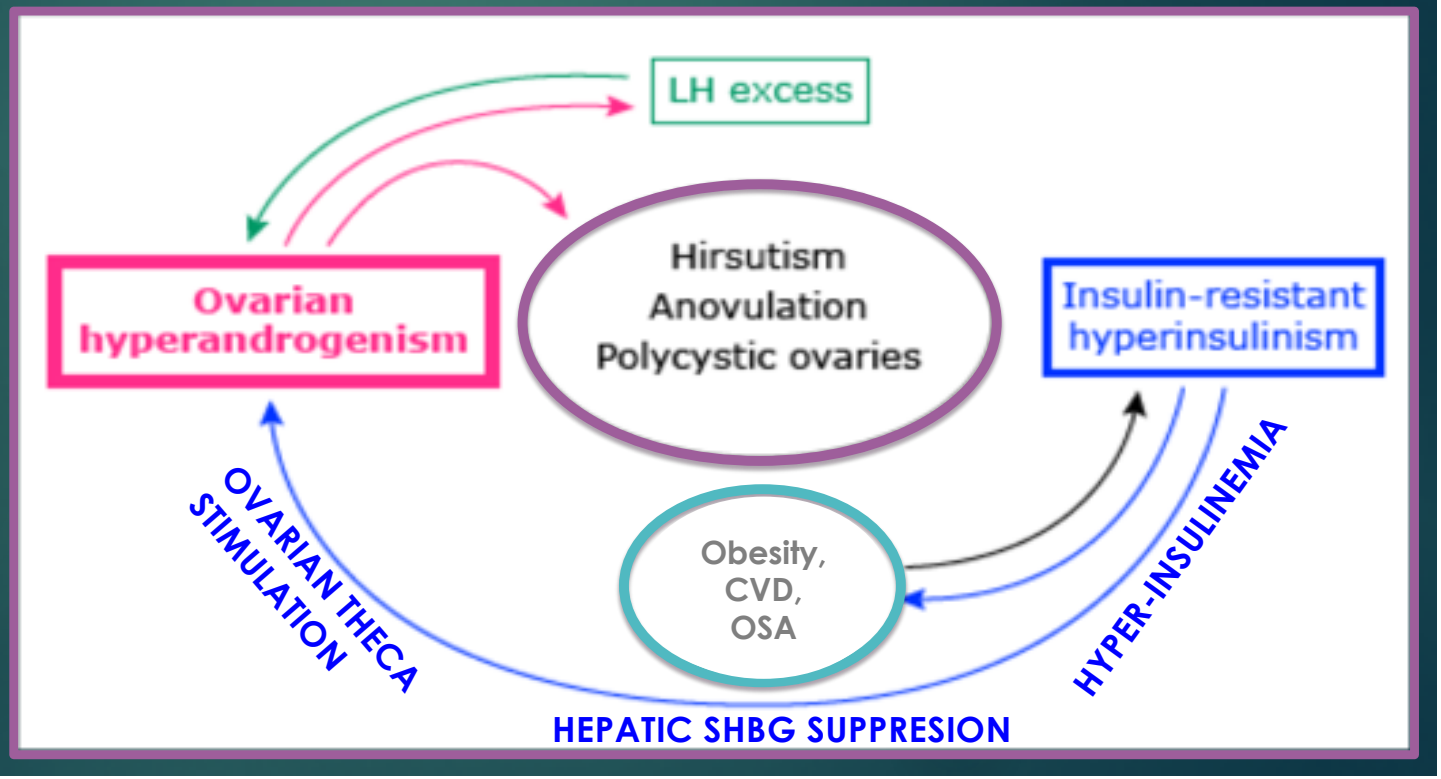


Image adapted from uptodate.com

THE BIG FOUR CLINICAL FEATURES

HYPERANDROGENISM (70-80% of pts)

- ↑ Free/Total serum testosterone
- Frontal balding
- Acne & Seborrhea
- Deepening of voice
- ↑ muscle mass
- Clitoromegaly (>1cm)

HIRSUTISM (5-15%)

- Male pattern hair growth

POLYCYSTIC OVARIES (>80% of pts)

- ≥20 follicles measuring 2-9mm
- Ovarian volume ≥ 10 ml on either ovary

OLIGOOVULATION (75-85% of pts)

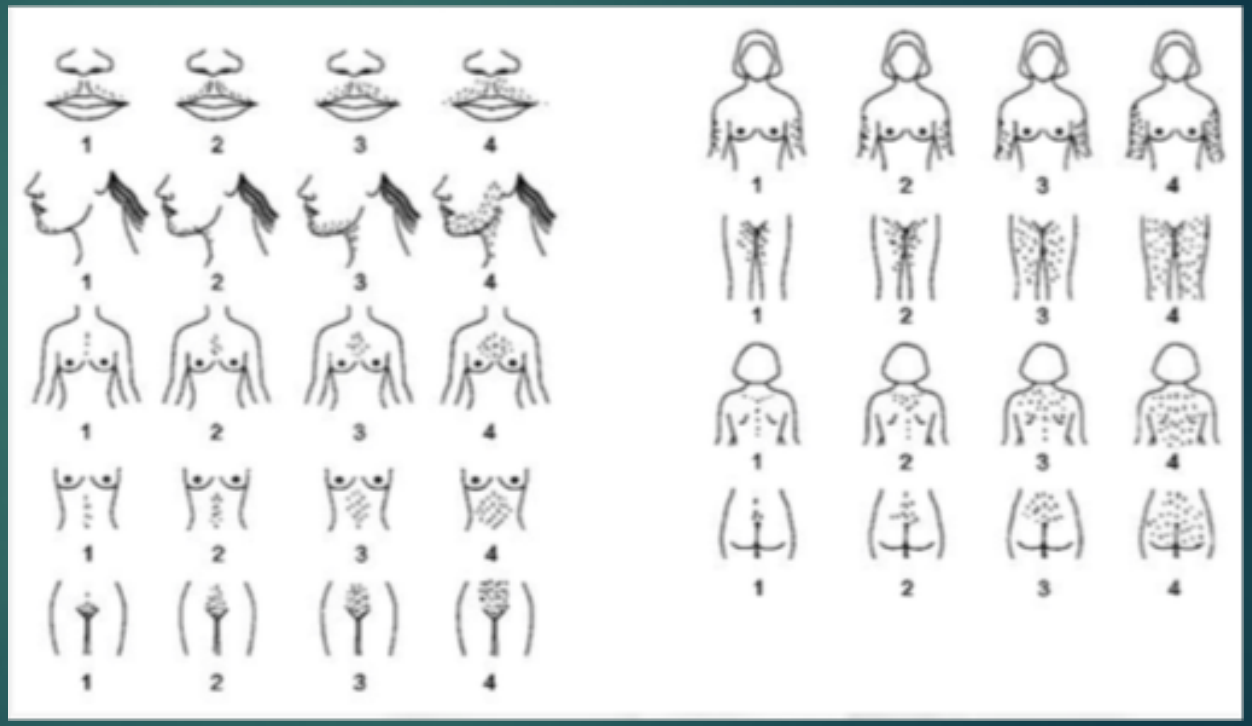
- Unpredictable variability of:
  - Menses interval (cycles of ≥36 days or <8 cycles a year)
  - Menses duration
  - Menstrual bleeding

INSULIN RESISTANCE

- 40% - Glucose intolerance
- 10% - Diabetic
- 75% - BMI > 25
- 70% - ↑ Lipids
- Acanthosis nigricans often present on exam

HIRSUTISM DIAGNOSIS

- MODIFIED FERRIMAN-GALLWEY SCORE (mFG)
  - 9 BODY-PARTS
  - SCORED ON 1-4 SCALE
  - SCORE >5-6 IS DIAGNOSITIC *(Depending upon ethnicity)*



PHENOTYPIC DEFINITIONS

- THERE IS DEBATE REGARDING TRUE PCOS DIAGNOSTIC CRITERIA

	NIH CONSENSUS (NEED 2/3 CRITERIA)	**ROTTERDAM** (NEED 2/3 CRITERIA)	**ANDROGEN EXCESS STUDY** (NEED 2/3 CRITERIA)
OLIGO-OVULATION	+	+/-	+/-
HYPERANDROGENISM *(CHEMICAL OR CLINICAL)*	+/-	+/-	+
HIRSUITISM	+/-		
POLYCYSTIC OVARIES		+/-	+/-

WORK-UP

- H&P: Ovulatory dysfunction? Hirsutism? Virilization? Obesity? Acanthosis nigricans?
  - Cycle length > 35 days can safely be assumed to be anovulatory
- Labs to consider:
  - Uncertain ovulation?: "Day 21" (mid-luteal phase) serum progesterone
    - If > 6 ng/mL → ovulation occurred this cycle
    - Otherwise, repeat in 2 days. If not rising → anovulatory cycle
  - Hirsutism/Virilization: Free & total serum testosterone
    - And important to rule out 21-hydroxylase Deficiency with serum 17-hydroxyprogesterone
  - Insulin-resistance: HgbA1c, 2-Hr GTT, fasting insulin
  - Oligomenorrhea: TSH, Prolactin, FSH
  - Other: Lipid profile
- Imaging: Transvaginal ultrasound

IF SEVERE VIRILIZATION, CONSIDER:

(A BROADER DIFFERENTIAL OF HYPERANDROGENISM)

- Ovarian/Adrenal androgen-secreting tumors
  - Consider work-up if very high total testosterone levels (>150-200 ng/dL) and order an abdominal CT/MRI to visualize the adrenals
- Drug-induced hirsutism
  - Ask about exogenous testosterone or DHEA use
- Cushing's Syndrome
  - If clinical features such as HTN, supraclavicular fat pads, purple abdominal striae, or proximal muscle weakness are present, perform a dexamethasone suppression test and/or urine free cortisol

LONG-TERM SCREENING/MGMT

- Recommend 150 min/week of moderate intensity physical activity (250 if obese)
- Q1-year screening for CVD
- Q1-3-year screening for DM
- Consider screening for OSA
- Be aware of increased risk of anxiety/depression
- Be aware of a 2-6x increased risk of endometrial cancer

IMPORTANT REFERENCES / LINKS

- PRACTICE BULLITEN 108 – PCOS

1. Teede et al, Hum Reprod 2018; 33(9): 1602-1618.
2. Azziz et al, Fert Steril 2009; 91(2):456-88.
3. Glueck et al, Hum Reprod 2002; 17(11): 2858
4. Qin et al, Reprod Biol Edocrinol 2013; 11:56
5. Hatch et al, Am J Obset Gynecol 1981; 14:815