Polycystic Ovarian Syndrome: Evaluation & Treatment

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I am a Nexplanon speaker and trainer for Merck/Organon.
15yo Polly presents to you for the first time for her wellness exam. No outside records, nothing in the EMR.

- PMH: None
- PSH: None
- Fam Hx: Depression, HTN, Hypercholesterolemia, Obesity.
- Meds: None
- Allergies: NKDA
- Gyn Hx:
  - Menarche: 11 yo, gyn age 4 years
  - LMP: 4 months ago
  - PMP: ?maybe 5-6 months prior to that?
  - Duration: 10-14 days
  - Dysmenorrhea: None
  - Flow: 5-8 heavy days, 5-9 medium to light days, some large clots.
- Maternal Hx: irregular and prolonged menses, delayed pregnancy (3 years)
- Soc Hx/HEADDSS: Only child, lives with mom + dad, no smokers or guns; 10th grade, B-student; likes video games and playing on her phone (>3 hrs/day); no substance use; identifies as female and uses “she/hers”; negative coitarche, no abuse or bullying.
Case: Polly

- Vital signs: BMI is 31 (>95th pc), HR 82, BP 119/72
- ROS: No HA, lightheadedness, fatigue, thirst, polyuria, abdominopelvic pain, no nipple discharge. +Acne, doesn’t like waxing all the time.
- PE: abdominal adiposity, facial acne, terminal hair (upper lip, chin, upper + lower back, abdomen), and acanthosis nigricans (nape of neck, axillae, umbilicus). No thyromegaly, frontal bossing or acromegaly, SMR 5 breasts - no galactorrhea. Declined GU exam.
- Labs: Hgb in office is 11.4 g/dL. POC Upreg negative.

NEXT STEP?
LABS - DIFFERENTIAL DIAGNOSIS

**Labs**
- Serum β-hCG
- ESR - if chronic illness suspected
- TFTs
- Prolactin - may be slightly ↑ in PCOS
- LH/FSH
- DHEAS
- 17-OH Progesterone
- Sex Hormone Binding Globulin (SHBG/SHBP)
- Free + Total Testosterone
- Androstenedione
- Hemoglobin A1c
- CBC
- LFTs

**Differential Diagnosis**
- Pregnancy
- Chronic illness
- Thyroid abnormalities
- Prolactinoma
- Premature Ovarian Failure
- Androgen-secreting Tumor
- Late-onset Congenital Adrenal Hyperplasia
- Obesity/Weight fluctuation
- Hypogonadotropic hypogonadism
- Polycystic Ovarian Syndrome
- Exogenous hormone use
- Cushing Syndrome
ULTRASOUND

• Transvaginal ultrasound is not widely used in adolescent girls - many virginal.

• Transabdominal ultrasound limited by obesity - poor image quality: a satisfactory image was obtained in 73% of slim women and only 38% of obese women.*

• Multiple follicles may be normal in adolescents.

• Increased ovarian volume may be increased in teens with PCOS (supportive) but is not diagnostic.

• Indicated when pelvic or abdominal pain/ovarian or adrenal tumor is suspected.
### Table 1. Suggested criteria for the diagnosis of PCOS in adolescence

<table>
<thead>
<tr>
<th>Required</th>
<th>Optional¹</th>
<th>Not recommended²</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Irregular menses/oligomenorrhea</td>
<td>1. PCOM</td>
<td>1. Obesity</td>
<td>1. Must generally be 2 years post-menarche</td>
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<td>2. Evidence of hyperandrogenism:</td>
<td>2. Severe cystic acne</td>
<td>2. Insulin resistance</td>
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<td>b. Clinical (e.g., progressive hirsutism)</td>
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<td>4. Biomarkers (e.g., AMH, T/DHT ratio)</td>
<td>of hyperandrogenism (e.g., NC-CAH, Cushing syndrome)</td>
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<td>5. Acanthosis nigricans</td>
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PCOS; polycystic ovary syndrome; PCOM, polycystic ovarian morphology; AMH, anti-Müllerian hormone; T/DHT, testosterone to dihydrotestosterone; NC-CAH, non-classical congenital adrenal hyperplasia. ¹ These criteria are often used in concert with the required criteria, but should not be used independently as diagnostic features. ² These criteria have been associated with PCOS but are not diagnostic.
• Refer to Adolescent and Young Adult Medicine
  • (NOT urgent unless patient is anemic <11 g/dL and with current prolonged bleeding).
• Screen for contraindication to estrogen-containing medication using U.S. CDC MEC
• If heavy bleeding and/or hemoglobin <9 g/dL, send to Emergency Department.
RESULTS

• Quantitative hCG – negative
• ESR - 15 (0-20 mm)
• TSH - 1.2 uU/mL (0.4-4.6) / FT4 - 1.44 ng/dL (0.8-2.0)
• Prolactin - 7.12 ng/mL (3.8-23.2)
• LH/FSH - 12.94 mIU/ml / 4.74 mIU/mL
• DHEAS* - 320 mcg/dL (37-307 mcg/dL)
• 17-OH progesterone - 112 ng/dL (10-290)
• Total Testosterone - 61 ng/dL (0-33 Tanner 5)
• Free Testosterone – 11.4 pg/ml (.7-3.6 pg/ml)
• Sex Hormone Binding Globulin - 15 ng/dL (>20 ng/dL)
• Androstenedione* (60% ovarian, 40% adrenal) - 251 ng/dL (<269 ng/dL)
• Hgb A1c – 5.5% (4.2-6.5%)
• Hgb - 11.9 g/dL (12.5-15 g/dL)

*may be mildly elevated in PCOS
PCOS STATISTICS

- Affects approximately 5-10% of all women of reproductive age*
- Affects 1% all adolescent girls **
- All prevalence studies based on different diagnostic criteria

*ACOG Practice Bulletin, 2009
**Christensen, et al, Fertil Steril 100(2), 2013
If no menses within past 2 months:

1st Provera (medroxyprogesterone acetate) 10 mg PO daily x 10 days
→ Withdrawal bleed within 2 weeks of completing 10-day course of Provera

THEN

Once patient has had period or withdrawal bleed within past 2 months:

Starting on 4th day of bleeding, patient starts daily combined oral contraceptive pill – norgestimate-ethinyl estradiol 0.25-35 mg-mcg (Sprintec, Ortho-Cyclen, MonNessa)*.

Counsel:

• need for pill daily – otherwise breakthrough bleeding
• immediate side effects – nausea, bloating

Please AVOID triphasic pills (TriSprintec, Ortho-Tricyclen, etc) – confusing!
Follow up in 6 weeks to check patient adherence, bleeding pattern, symptoms of clot/hypercoagulation.

*Endocrine Society also mentions Ortho-Evra patch and Nuvaring
NON-PHARMA, ADJUNCT & ALTERNATIVE TREATMENTS

Low glycemic index diet*
Daily aerobic exercise*

Consider:
Vitamin D
Metformin (start with 750 mg PO at dinner) – counsel re: N/V/D, increased fertility

Contraindication to estrogen:
Hormonal IUD
Episodic progestins (q 1-3 month withdrawal bleeds)

*Difficult to sustain and unhelpful if BMI WNL
ADDITIONAL EVALUATION

• Signs and symptoms of sleep disorder
• Waist circumference
• Fasting insulin
• 2 Hour Oral Glucose Tolerance Test*
• Fasting Lipids-high triglycerides, low HDL 70%
• Hemoglobin A1c
• Liver function tests if obese

*May do fasting glucose only in lean girls
COUNSELING

• Metabolic Syndrome
  ▪ Insulin resistance-acanthosis nigricans
  ▪ Dyslipidemia
  ▪ Hypertension
  ▪ Abdominal adiposity

• Sub-fertility

• Type II diabetes mellitus has been shown to be more prevalent in women and adolescents with PCOS

• Endometrial, ovarian and breast cancer may be more prevalent

• Infertility is more prevalent

• Cardiovascular disease risk

• Endometrial and breast cancer risk
References


Mahalo to Dr. Elizabeth Alderman, Children’s Hospital At Montefiore

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