PCOS: THE BASICS

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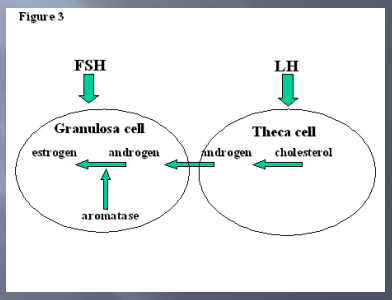
Nothing to Disclose

PCOS is the most common endocrinopathy in women

- 7% of all women 18-45
- Obesity 1/3 of all US women
- Incidence of PCOS is increasing with increase obesity

What normally happens in the ovary?

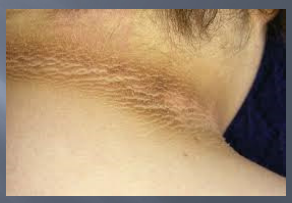


Signs of PCOS

- Obesity
- Irregular menses
- Normal gonadotropins
- Not pregnant
- Insulin resistance
- Hirsutism
- Acne/ hair loss

HAIR-AN

Hyper-Androgenism
Insulin Resistance
Acanthosis Nigricans



3 PCOS Criteria Schemes

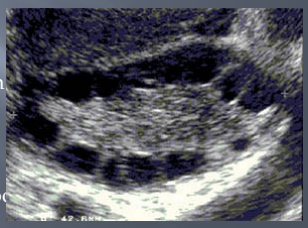
- NIHCD 1990
- Rotterdam 2003
- AES 2006

NIHCD 1990

- Hyper-androgenism
- Irregular menses
- Excludes other diagnoses
- Weaknesses: not all PCOS have either of these, but a broad spectrum of disease from mild to severe

Rotterdam 2003

- Any 2
- Oligoovulation
- Hyperandrogenism
- PCOS-appearance on ultrasound
- Excludes other diagnoses
- Weakness, may be too inclusive



Androgen Excess Society

- Hyperandrogenism with hirsutism
- Oligoovulation
- Excludes others diseases
- Weakness, may make treatment pool too small
- Doesn't account for obesity, insulin resistance

Obesity in PCOS

- Present in 35-60% of PCOS patients
- Difficulty losing weight major presenting symptom
- PCOS worsens with increase weight
- Seems to be a set point over which things go downhill

Insulin Resistance

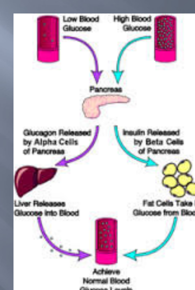
- Prevalence is 50-75% in PCOS
- Type II DM in 10 % of PCOS
- A HUGE PROBLEM: Diabetes now costs $276 Billion per year direct and indirect costs
- $174 Billion just for hospitalization and meds

WHAT IS INSULIN RESISTANCE?

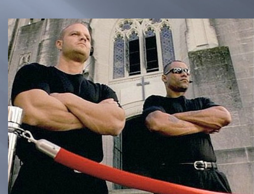
A little story

You eat a donut

Pancreas releases insulin



Fat cells block admission



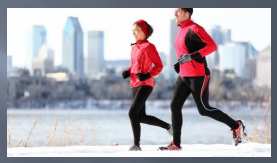
Pancreas is insistent

Glucose rushes into fat cells: including what is needed for energy

Blood sugar drops dramatically

Vicious Cycle

Breaking the vicious cycle



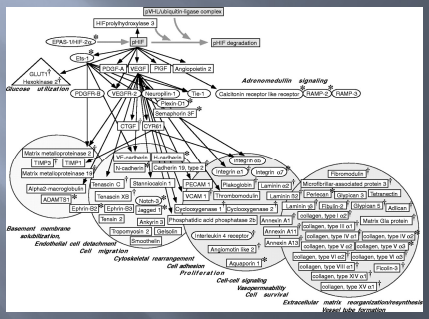
What does this have to do with ovulation?

- Increase pulses of LH in PCOS
- Increased estrone made in fat cells
- E1 inhibits FSH
- Lower FSH fails to stimulate follicles appropriately
- Elevated LH tone fails to signal LH surge
- No ovulation of mid-sized follicles

There's more

- IGF 1 and 2 are important hormones in ovarian control of ovulation
- Excess circulating insulin binds to their receptors and blocks their action
- Excess fat results in increase places to make estrone from androstenedione
- Higher LH results in more androstenedione and less estradiol in the ovary, inhibiting follicle growth

Had enough endocrinology?



The Work Up

- H&P
- Weight BMI BP abdominal circumference
- Breast staging if patient is young, look for discharge
- Thyroid
- Acanthosis nigricans, acne, male hair loss, hirsutism, skin tags, striae purple or white
- Buffalo hump, thin limbs, skin and muscle breakdown

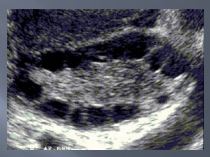
Ferriman Gallwey Scale

- If hirsutism is present, she has too much androgen. No need to check Testosterone or other androgens AS LONG AS THERE'S NO VIRILISM

Ferriman Gallwey scale

PCOS ultrasound

- Rotterdam criteria
  - >12 2-9 mm follicles total
  - Up to 25% normal women meet these criteria
  - Therefore other factors must be present



Testing for Insulin Resistance

- No standardized criteria
- 2 hour GTT is often recommended but may not be sensitive enough to detect patient who may benefit from metformin
- 75g, 2 hour glucose less than 140, 2hour insulin > 80-100
- Inconvenient, uncomfortable, expensive

Adrenal testing not needed unless

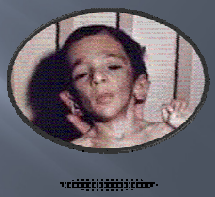
- Hirsutism occurs young
- Positive family history
- High risk ethnic groups
- 17OHP (am)
  - <200 is normal
  - >800 is diagnostic
  - 200-800 more testing is required (ACTH stim)

Work up in review

- Pregnancy test
- Prolactin, Day 3 FSH (if cycling), TSH
- Ultrasound of ovaries
- If all bloods are normal and ultrasound meets criteria with symptoms, you've got a patient with PCOS

Rare diseases

- Leprechaunism is severe congenital insulin resistance caused by a mutation in the insulin receptor
- Death in infancy is common
- Elfin features, LBW, failure to thrive



Rare diseases

- Cushing disease
- Truncal obesity, thin limbs
- Diabetes, hypertension
- Excessive cortisol
- Dexamethasone suppression test is best screen
- 1:1 million

Other tests that may be worthwhile

- Endometrial biopsy if menses less than 3 per year for several years
- Fasting lipids
- Complete metabolic panel if metformin planned
- Testosterone total and/or free if virilism or no response to therapy

Treatment

- Weight loss: even 2-5% will help
- Exercise reduces insulin resistance and increases sensitivity, even without weight loss
- Hormone therapy
- Metformin
  - Increase dose gradually
  - Dietary counseling: no sugar, syrup, HCFS
  - If not tolerating, try XR, food diary

PCO=OCP

- Regulates cycles
- Contraception
- Increases SHBG
- Decreases androgens
- Acne
- Hirsutism
- Protection from endometrial hyperplasia

Ovulation induction

- Clomid start day 3-5, continue for 5 days
- Do pregnancy test before taking
- Do ultrasound day 10-12 if no ovulation
- LH kit for timing intercourse
- Baseline ultrasound to rule out cysts

Hirsutism

- Eflornithine (Vaniqa) faster than laser but not permanent
- Spironolactone
- Flutamide
- Laser
- Electrolysis
- Antiandrogens need a good contraception!!

Summary

- Rotterdam Criteria need oligoovulation, hyperandrogenism, PCOS ovaries 2/3
- Insulin resistance and obesity are most important comorbidities
- Diet and exercise are mainstays of treatment
- OCP for cycle control, hyperandrogenism
- Antiandrogens for hyperandrogenism, but need birth control
- Clomid for ovulation induction
- Metformin for insulin resistance and help with weight loss