- Infertility and PCOS
- Dr Nahid lorzadeh

- Ob-gyn specialist and infertility fellowship

Learning Objectives

Following the presentation *"Infertility and PCOS"* participants should be able to:

- Diagnose PCOS.
- Understand the differences between PCO, PCOS and PCOM.
- Decide on possible treatment.
- Exclude other problems.

DEFINITION

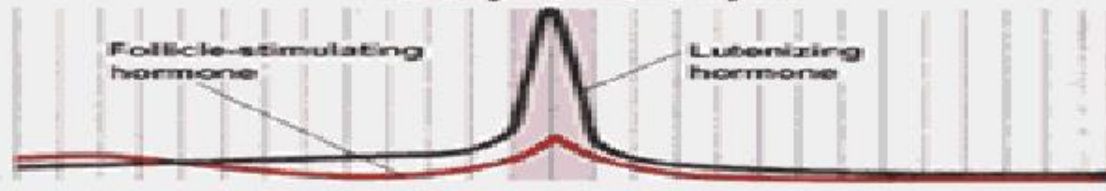
- **Inability to conceive after a year of exposure to conception.**
  - Six months > 35 years old.
  - A disability and a disease… NOT an elective condition.
  - Great societal and demographic impact

Factors

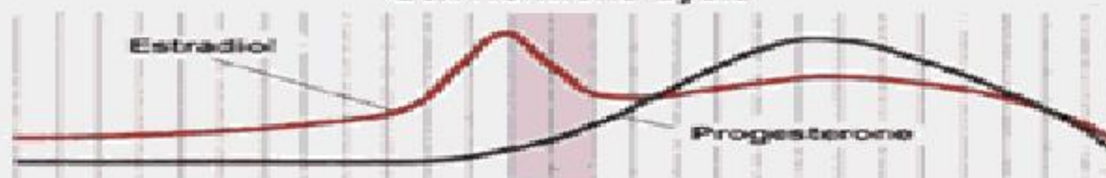
- Male
- Ovarian
- Cervical
- Peritoneal
- Tubal
- Uterine
- Unexplained

Ovulation

- An LH (luteinizing hormone) surge occurs 24 to 36 hours prior to ovulation (Follicular rupture = It is the ovary's job to make a cyst and rupture it.)
- Progesterone is increasingly produced after the LH surge
- Secretory changes occur in the endometrium due to progesterone.


Pituitary Hormone Cycle
Follicle-stimulating hormone
Lutenizing hormone

Ovarian Cycle
Follicle
Corpus luteum
Ovulation


Sex Hormone Cycle
Estradiol
Progesterone

Endometrial Cycle
Uterine lining
Menstruation

Follicular Phase
Luteal Phase

Ovulatory Phase
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
Day of Cycle

Ovulation

- Pregnancy is absolute proof of ovulation.
- Serum progesterones are 99%+ proof of ovulation. These are done:
  - 8 days after a positive ovulation test
  - 7 days after ovulation on a monitor
  - Day 21 and 24 if ovulation day is uncertain.

Ovulation Disorders

- PCOS
- Hypothyroidism
- Hyperprolactinemia
- Weight Loss / Weight Gain

PCOS

- Diagnosis
  - Somatic Hyperandrogenism
  - Lab Hyperandrogenism
  - Oligo-anovulation
  - PCOM (polycystic ovarian morphology)

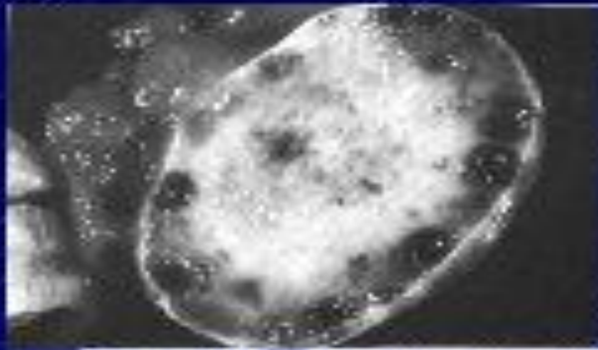
PCOM

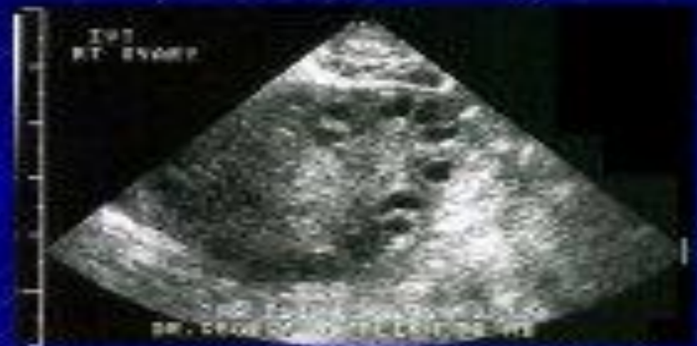
- PCOM (polycystic ovarian morphology)
  - ≥ 12 follicles at 2 - 9 mm in at least 1 ovary
  - Volume > 10cc
  - Does not apply if on BCPs
  - If a follicle is >10mm, repeat scan next cycle.

2003 Rotterdam ESHRE/ASRM Consensus. Fertil Steril 81:19, 2004

PCOM

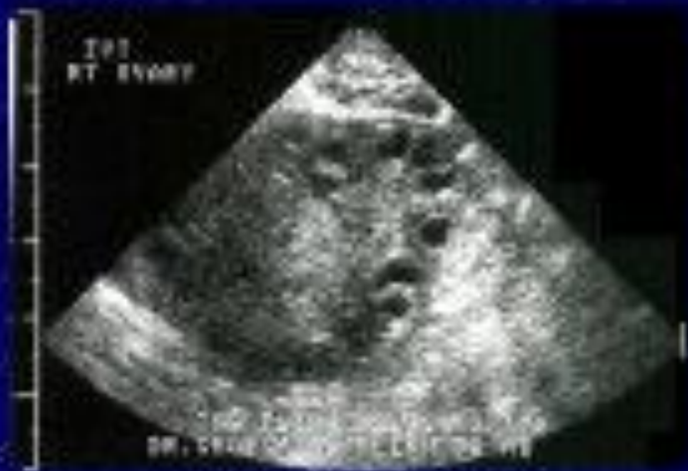
PCOM (polycystic ovarian morphology)

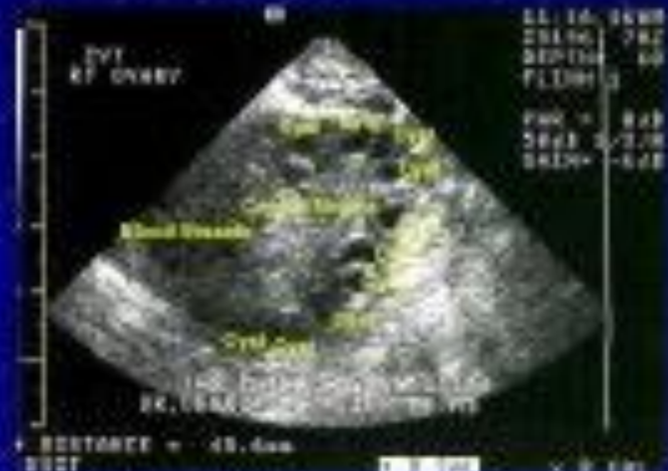




PCOM

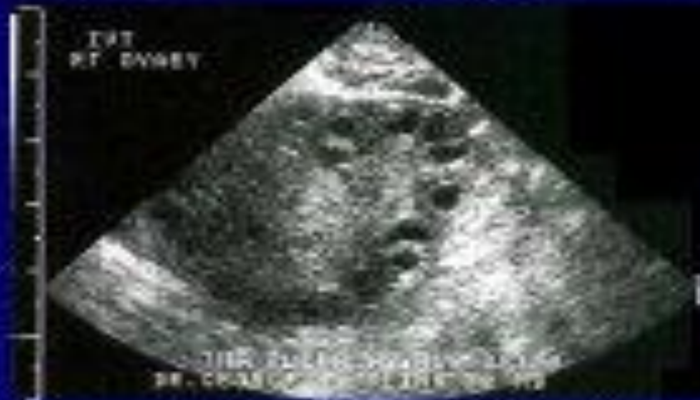
PCOM (polycystic ovarian morphology)

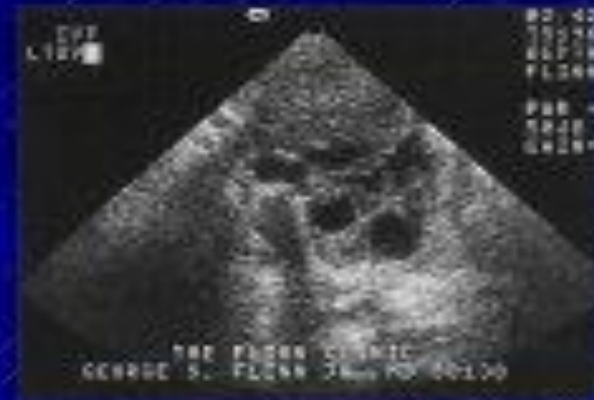




PCOM vs. Follicles

PCOM (polycystic ovarian morphology) vs. Pre- ovulatory Follicles





Screening Tests

- FSH and E2
- Prolactin
- TSH
- 17-OHP
- Lipids / HDL decreased
- SBHG decreased
- 2 hour glucose to screen for diabetes

Exclude

- Non-classical 17-hydroxylase deficiency can look like PCOS
- HAIRAN - hyperandrogenic insulin resistance and acanthosis nigricans
- Adrenal tumor
- Cushing's
- Prolactin
- Thyroid
- Pituitary insufficiency
- Hypothalamic amenorrhea

Stop Using

- "Inappropriate LH" as a diagnosis
- LH / FSH ratio as it is not sufficiently predictive
- Fasting insulin as it is not sensitive
- Dexamethasone therapy can induce insulin resistance

Utility of LH/FSH Ratio

- Study designed to understand the biological variability of the LH/FSH ratio in women with PCOS vs. women with normal menstruation over one full cycle
- Will assess the diagnostic utility of the LH/FAH ratio
- 10 consecutive blood samples were taken at 4 day intervals in 12 PCOS patients and 11 age and weight matched controls
  - Cho, LW, et. al. Bio variation of the LH/FSH ratio in normal women and those with PCOS. Endocrine Abstracts (2005) 9 p80

PCOS

- Treatment
  - Weight loss and exercise
  - Clomid (clomiphene citrate) (3 months)
  - Letrozole (Femara®) (aromatase inhibitor) (3 months)
  - Metformin (6 months)
    - Note that the combination of metformin and clomiphene are more productive at months 4-6 compared with months 1-3 .
  - Gonadotropins

PCOS

- Weight loss
  - Poor results if BMI > 50
  - Requires a dedicated program of diet and exercise
  - Use dieticians who work with diabetics
  - Liposuction of cutaneous fat is not the same as loss of visceral weight
    - Richard S. Legro, MD, Penn State College of Medicine, Hershey PCOS PG Course, ASRM, New Orleans, October 2006

PCOS

- Medications
  - BCPs may be better with thin patients that have normal HDL and SHBG
  - Metformin causes more nausea and weight loss than metformin-XL
  - Sibutrimine (Meridia ®) – for weight loss
  - Androgen receptor antagonists for hirsutism
    - Spironolactone (Aldactone®) and Flutemide (Propecia®)
  - Ketaconazole (Nizoral®)
  - Florinithine (Vaniqa®) cream