



OVARIAN RESERVE ASSESSMENT

BY

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Background

Ovarian reserve (OR) :

- **Female fertility declines with increased age; decline starts at 30, virtually zero at mid 40s. This is due to decrease in oocyte quantity and quality.**
- **OR Effects the response to ovarian stimulation.**
- **OR Effect the chance of pregnancy**



Assessment of ovarian reserve by:

- 1- **Follicle stimulating hormone (FSH): early follicular phase**
- 2- **Estradiole (E₂) level**
- 3- **Progesterone level (mid-luteal)**
- 4- **Inhibin B level**
- 5- **Antimullerian hormone (AMH)**
- 6- **Ultrasound :**
 - **Antral follicle count (AFC)**
 - **Ovarian volume**
 - **Ovarian blood flow**
- 7- **Dynamic tests:**
 - **Clomiphene citrate challenge test (CCCT)**
 - **Exogenous FSH ovarian response test (EFFORT)**
 - **Gonadotropin agonist stimulation test (GAST)**
- 8- **Ovarian biopsy**



Follicle stimulating hormone (FSH)

- **Usually measured on cycle day 2 or 3.**
- **Women with FSH > 10 IU/L do worse.**
- **Women with FSH > 15 IU/L on one test do worse on IVF**
- **Variation from month to month:**
 - **For young women even one low level means reduced yield.**
 - **For women > 40 years are ominous.**



Serum estradiole (E₂)

- **E₂ alone is of little value**
- **Suggested E₂ of >80pg/ml day 3 pre IVF cycle---higher cancellation rate**
- **Some attempts to combine E₂ and FSH levels-----of little value**



Serum progesterone

- **Early LH surge and elevation of progesterone (P₄) suggested sign of poor ovarian reserve .**
- **No independent role in assessment of ovarian reserve.**
- **E₂/P₄ ratio may have a role in differentiating conceptual cycles**



Anti-Mullerian Hormone (AMH)

- **AMH is a glycoprotein**
- **Appears in female serum at puberty**
- **It is secreted by granulosa cells of pre-antral and small antral follicles**
- **Physiological function = prevent excessive follicle recruitment.**
- **Not cycle-dependent ; can be measured any day**
- **Less cycle to cycle variation than FSH**
- **Not affected by GnRH agonists, can be measured during down-regulation.**
- **Clinical role not definitely established .**
- **More accurate than other tests, but still expensive**



Inhibin β

- **Heterometric protein 32kDa similar to AMH**
- **Selectively inhibits FSH (TGF- β family)**
- **Levels > 45pg/ml---poor response to FSH**
- **But high false positive rate**
- **Not currently useful**



Antral Follicle Count (AFC)

- **Follicle 2 to 5 mm on Day 1 or 2**
- **Inter-observer variation**
- **Some correlation with ovarian response but only at low threshold**
- **If $AFC < 5 \rightarrow$ significantly worse outcome**



Ovarian vascularity

- **Trans-vaginal pulse Doppler can assess ovarian blood flow. However, much heterogeneity of techniques due to different equipment, and variation in technique.**
- **Some suggestion that high vascularity in late follicular phase is a good prognostic sign**
- **No clinical value at present**



Clomiphene citrate challenge test (CCCT)

(Navot, Rosenwaks, Margolioth 1987)

1. **Measure baseline E₂, FSH, LH at cycle day 2-3**
2. **Administer CC 100 mg/ day (day 5-9)**
3. **Measure E₂, FSH, and LH on Day 9-11**
4. **Exaggerated FSH after CC bad prognostic sign**
5. **Probably no better than basal FSH**



Exogenous FSH ovarian reserve test

(EFFORT)

(Fanchin et al 1994)

- **Baseline E₂ and FSH**
- **Administer 300 IU FSH**
- **Re-check E₂, 24 hrs. later**
- **Of no proven benefit**



GnRH-agonist stimulation test (GAST)

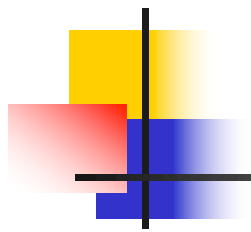
[Garcia 1993]

- **Physiological response to GnRH agonist is a flare up followed by suppression.**
- **Latent impairments of ovarian function may be diagnosed by abnormal response.**
- **Data are still insufficient for clinical use**



Ovarian Biopsy

- **Reproductive potential depends on the number of primordial follicles in ovarian cortex.**
- **Counting the number of follicles on ovarian biopsy is an attractive concept. However, biopsies studied showed high variation in follicular numbers.**
- **Of no clinical value**



THANK YOU

