

Editorial

Assessing Ovarian Reserve

Ovarian reserve defines a woman's reproductive potential as a function of the number and quality of her remaining oocytes¹. The general purpose of ovarian reserve testing is to assess the quality and quantity of the remaining oocytes in an attempt to predict reproductive potential. Female reproductive aging is a process that follows the generally accepted theory that over time, oocytes decrease in quantity and quality due to programmed cell death and continuous atresia and apoptosis go on from intrauterine life till menopause and beyond. Although this reproductive decline occurs with age, there is significant variation in fertility among women of similar age, which highlights the unpredictability and individuality of the reproductive aging process².

The main goal of ovarian reserve testing is to identify those individuals who are at risk of decreased or diminished ovarian reserve, commonly known as DOR³. Women with diminished ovarian reserve commonly have regular menses but a reduced quantity of ovarian follicles and limited response to ovarian stimulation with fertility medications. Female age and ovarian reserve test results are useful for discussing prognosis and recommending a treatment plan.

When to perform the testing?

Ovarian reserve testing should be performed for women older than 35 years who have not conceived after 6 months of attempting pregnancy and women at higher risk of diminished ovarian reserve. In a cross sectional study Indian women are reported to age six years in advance to their Spanish counterpart when matched for their AMH and AFC⁴. In our clinical practice significant number of women are found with poor ovarian reserve at early 30s. Considering this fact ovarian reserve testing for women of this region can be started at earlier age at 30.

The conditions, which reduce ovarian reserve

- Advanced reproductive age (older than 35 years)
- Family history of early menopause
- Genetic conditions (eg, 45,X mosaicism)
- *FMR1* (Fragile X) premutation carrier

- Conditions that can cause ovarian injury (eg, endometriosis, pelvic infection)
- Adhesiolysis for endometriosis or PID.
- Cystectomy for endometrioma and benign ovarian cyst.
- Oophorectomy
- Unilateral or bilateral salpingectomy.
- History of cancer treated with gonadotoxic therapy or pelvic irradiation
- History of medical conditions treated with gonadotoxic therapies
- Smoking

What are the tests to be performed?

A. Transvaginal ultrasonography

1. Antral Follicle count (AFC): The antral follicle count records the number of visible ovarian follicles (2–10 mm mean diameter) that are observed during transvaginal ultrasonography in the early follicular phase (cycle days 2–5). A low antral follicle count is considered 3–6 total antral follicles and is associated with poor response to ovarian stimulation during IVF.
2. Ovarian volume: The calculation of ovarian volume requires ovarian measurements in three planes and the use of the formula for the volume of an ellipsoid: $D1 \times D2 \times D3 \times 0.52$. Though ovarian volume has limited value compared with antral follicle count for detection of diminished ovarian reserve^{1,5}. It is helpful for predicting the reserve in some cases. It should be more than 3cm³.

B. Biochemical tests

1. Basal Follicle stimulating hormone (FSH) : It is usually done in early follicular phase on D1-D3. It should be < 10 IU/L and ³10IU/mL indicates poor OR.
2. Basal Oestradiol (E2): It is also done in early follicular phase and it should be <80pg/ml. > 80 pg/ml indicates poor OR and more than 100 pg/ml indicates very poor OR.
3. Inhibin B: It is also done in early follicular phase and normal value is 180pg/ml or more.

4. Antimullarian hormone (AMH): It secretes from antral and preantral follicle and can be measured at any time of the cycle. It is the best predictor of ovarian reserve. Value 1-3 ng/ml considered as normal. Less than 1ng/ml indicates poor OR.

The purpose of ovarian reserve testing is to identify women at risk of decreased or diminished ovarian reserve for individualizing treatment strategies for each woman.

It is reasonable to counsel the woman that her window of opportunity to conceive may be shorter than anticipated, and attempting to conceive sooner rather than later is encouraged. During the evaluation of infertility, factors such as female age, infertility diagnoses, and ovarian reserve test results are used to counsel the individual or couple about their prognosis and to formulate an appropriate treatment plan.

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