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Editorial

Ovarian Reserve and Low Anti-Mullerian Hormone (AMH)

AMH is a product of granulosa cells of the preantral and small antral follicles of the ovaries. AMH regulates folliculogenesis by inhibiting recruitment of follicles from the resting pool in order to select the dominant follicle, after which the production of AMH diminishes. It is used as a predictor of follicular pool of a woman, called ovarian reserve[1]. Ovarian reserve or in other words number of oocytes in the ovary can be used to predict the length of reproductive life, which is very essential for infertile women. AMH can also be used as a marker for ovarian dysfunction, such as in women with polycystic ovarian syndrome (PCOS).

AMH expression is greatest in the recruitment stage of folliculogenesis, then expression diminishes as follicles develop and enter selection stage. It is useful in fertility assessment and identifies women that may need active treatment at earlier than later if their long-term future fertility is poor. In some occasion fertility preservation may need for future use in which estimation of AMH level give some clue about ovarian preservation.

AMH is a predictor for ovarian response in vitro fertilization (IVF). It is useful for selecting the dose of ovarian stimulating drug for a particular patient. Higher AMH levels are associated with greater chance of live birth after IVF, even after adjusting for age [2,3]. AMH can thereby be used to optimise the ovarian stimulation in order to maximise pregnancy success rates whilst minimising the risk of ovarian hyperstimulation syndrome (OHSS) [4,5].

Diminished Ovarian Reserve:

A level of AMH less than 1.21 is considered as diminished ovarian reserve and predicts a low response to ovarian hyperstimulation. Diminished ovarian reserve (DOR) is characterized by poor fertility outcomes even when assisted reproductive techniques (ART) are used. It is a great challenge for reproductive medicine specialists to manage such cases. Identification of women with DOR, would enable more individualization of treatment to reduce time to live birth, to select protocol of treatment and to counsel the couples about result of treatment and pregnancy chances.

Causes of Diminished Ovarian Reserve (DOR):

- Progressive decline along with increasing age
- Idiopathic
- Genetic (Fragile X syndrome)
- Unilateral oophorectomy
- Unilateral or bilateral ovarian cystectomy due to chocolate cyst or benign neoplasia.
- Endometrioma
- Autoimmunity
- Chemotherapy
- Radiotherapy
- Pelvic infection

Prevention of diminished ovarian reserve:

Endometriotic cyst excision markedly reduces the AMH[6]. Thus, avoiding unnecessary surgeries and offering alternative therapies wherever indicated, will help in reducing the burden of iatrogenic diminished ovarian reserve. Among young cancer patients, fertility preservation may be done by ovarian tissue cryopreservation (OTC), oocyte or embryo freezing prior to chemo/radiotherapy. Gonadotropin-releasing hormone analogue (GnRHa) use has been found promising in preserving fertility if administered during chemotherapy.

Management of diminished ovarian reserve:

As reproductive life span becomes shorter, patient needs active and advanced treatment. Adjuvant therapy like DHEA, Co-Q 10 and melatonin might help in increasing quantity and quality of eggs. Assisted reproductive technology (ART) is better option for these group of women to reduce the time to live birth. For ART, different individualized protocol should be adopted to optimize the good number of good quality egg retrieval. Donor egg is the ultimate option for women who failed to produce any egg.

Conclusion:

Measuring AMH alone may be misleading due to wide variations of laboratory reports, therefore; AMH levels should be considered in conjunction with transvaginal scan of the ovaries to assess antral follicle count and ovarian volume. Women with low AMH or DOR should be appropriately counseled to undergo aggressive approach to achieve pregnancy in time.

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