

Significant of Antimullerian Hormone [AMH] Test for Women Infertility



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Introduction

Over the last decade, a large number of studies examining the multiple roles of AMH have been published [1]. AMH produced by granulosa cells [GC] of the ovary [2,3]; AMH, also known as Mullerian-inhibiting substance, is a dimeric glycoprotein that belongs to the transforming growth factor $-\beta$ family [4,5]. It is virtually undetectable but increases gradually until puberty and remains relatively stable through the reproductive period [6,7]. It is widely accepted that the reduction of AMH levels in serum is the first indication for decline in the follicular reserve of the ovaries and can be measured in the blood at any time in the menstrual cycle due to its stability [8,9]. AMH is a marker for ovarian reserve and naturally lower in older women [>40 year] and higher in women with Polycystic ovaries [PCO] and polycystic Ovary Syndrome [POCS] [10,11]. It was reported that Follicle stimulating hormone [FSH], Estradiol [E2] levels and antral follicle count [AFC] have been used for evaluation of ovarian reserve to determine suitable treatment strategy for female infertility by age [2,11], which becomes very essential in recent years.

Traditionally, age, follicle stimulating hormone [FSH], [E2] levels and antral follicle count [AFC] at have been used for evaluation of ovarian reserve the early follicular phase [2]. Levels of FSH and E2 were considered to be the determining biochemical markers for assessment of low ovarian reserve for many years [2] and FSH level was found above the norm only in cases when the ovary function is largely decreased [12] however, it is still the most commonly used test although its reliability is weak and also FSH association with significant inter- and intra-cycle variability is documented [13,14]. Opposing to FSH, AMH is considered to be more specific marker for ovarian response to gonadotrophins In comparison with other ovarian reserve assessment tests and is characterized by a number of advantages. AMH level is stable throughout the menstrual cycle and therefore can be measured at any day of the cycle [14,15] and it is not affected by other hormonal variations, including the use of oral contraceptives [16].

Recent studies have shown that AMH can be a good predictor of ovarian reserve and the success rates of in vitro fertilization

[IVF] [17-19] however, both AMH and FSH are still used as ovarian reserve tests [20] although FSH showed several obstacles where patients have been reported to show discordant values for their ovarian reserve and cycle outcome [10,21-23], poor response to gonadotrophin stimulation on day 3 [23], lower chances of pregnancy [24] except at high threshold level of ovarian response. Adding to that FSH needs to be measured during early follicular phase [25-27]. In contrast AMH comparing to other ovarian reserve assessment tests is characterized by a number of advantages and can be tested on any day of the menstrual cycle [28-30], although variation in level of FSH between different blood samples for the same patient was reported during the same menstrual cycle especially in young patients [31,32] never the less AMH can still show 80% sensitivity and 93% specificity in predicting poor ovarian response at random blood test [33].

AMH level showed correlation with number of oocytes retrieved and hence treatment can be individualized for optimal cycle [28-30]. The fact that AMH reported to show assays controversies [34], pregnancies even at undetectable levels [35] and intra-cycle variations level [32] raised question mark about the possible role of AMH in reproduction assessment. Although other studies showed that levels of FSH and E2 were used as biochemical markers for assessment of low ovarian reserve for many years, identification of AFC at later stage still considered more reliable marker in assessment of the ovarian reserve where, Follicle count can be determined easily using high resolution sonographic systems [26,36,37], although few reports showed that some difficulties were faced in obtaining AFC however, it had been recommended over basal FSH [38].

Thus, by some investigators AFC is considered as the first choice test and FSH and AMH are two different hormones that can be used to predict ovarian reserve at two different stages of follicular development [26,38] although FSH level had been reported to reflect antral and postantral follicular development while, AMH values represent post primordial prenatal follicular pool [21]. Despite the use of both FSH and AMH hormones in

parallel to determine ovarian reserve, there is not much literature about the frequency of discordance and concordance between them and its clinical significance [21]. Therefore, future research still required to determining the frequency of concordance and discordance between AMH and FSH levels in female infertility patients and assessment of ovarian reserve to determine the strategy for treatment of female infertility. Recently, identification of AMH levels became important in assessment of ovarian reserve and identification of AMH level for assessment of ovarian reserve is a recent method to follow and the obtained data are divergent, implementation of further studies and obtaining more materials in this field are viewed as justified and reasonable.

The available test measures how much “anti-müllerian hormone” a woman produces in her ovarian follicles, is fast becoming the pre-eminent tool for fertility specialists in North America and Europe to determine the chances of their patients getting pregnant reported by Dr. Tom Hannam of the Hannam Fertility Centre in Toronto as reported by Cathy Gulli [39]. The objective of this editorial is to illustrate the significant of anti-Müllerian hormone [AMH] in respect to other fertility hormone such as follicle stimulating hormone [FSH] so that we the most reliable marker could be indicated and adequate strategy for the initial stages of infertility treatment could be laid out.

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