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Significant of Antimullerian Hormone (AMH) as Fertility Marker

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Abstract

Role of Anti-Mullerian hormone (AMH) test indicate adequate strategy for the initial stages of infertility treatment.

Keywords: Antimullerian hormone (AMH)

Introduction

AMH is defined as: "Anti-mullerian hormone, it is a protein released by the ovaries that start the growth of an egg in the ovaries and is related to the development of follicles in the ovary. AMH levels correspond to the number of antral follicles, that can be used to indicate the number of eggs available in the ovaries [1,2]. It is virtually undetectable but increases gradually until puberty and remains relatively stable through the reproductive period [3,4]. A very low level of AMH may indicate poor ovarian reserves. A very high level of AMH may correspond to PCOS. One of the best uses currently of the AMH test is the ability to titrate fertility medications based on ovarian reserve and the ability to differentiate between polycystic Ovary Syndrome (PCOS) and those potential donors with a PCOS like ovarian response. By utilizing AMH, those woman with higher numbers may stimulate faster on less fertility medication and it can help decrease hyper stimulation in the high AMH and basal antral follicle count donors [1].

Level of AMH hormone corresponds to the number of eggs a woman has left in her ovarian reserve. That decline with age, however, not every woman is borne with the same number of eggs or loses them at the same rate [5]. There are some factors influence ovarian reserve such as genetics, exposure to chemotherapy, radiation and some medical conditions [5]. AMH detection is very good test because it indicates some information about biological clock, where no reliable test give such information before. [5]. AMH can be tested on any day of the menstrual cycle and It's levels correlate with the number of oocytes retrieved and treatment can be individualized for optimal cycle [6-8], although level variation between different blood samples for the same patient was reported during the same menstrual cycle especially in young patients [9,10] never the less AMH can still show 80% sensitivity and 93% specificity in predicting poor ovarian response at random blood test [11] and It's levels correlate with the number of oocytes retrieved and treatment can be individualized for optimal cycle [6-8].

The facts that AMH reported to show assays controversies [12], pregnancies even at undetectable levels [13] and intracycle variations level [14,15] raise question about the possible role of AMH to assist reproduction. 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 [14,15]. Normal ranges of AMH in under 30 population tend to be higher than a 1.0ng/ml. Most fertility professionals use a cut-off of 1.5 up to 8.0 to gauge fertility potential in oocyte donors and many will use an AMH up to 14-15ng/ml even though this could indicate PCOS. With higher AMH numbers the need for special attention in medication titration is warranted [1]. Until now, a woman's ovarian reserve was checked using methods that have been around for decades [5]. Follicular-stimulating hormone (FSH) for instant must be measured using a blood test on day three of a woman's menstrual cycle, but it can fluctuate from month to month, unlike AMH also antral follicle count is done using vaginal ultrasound, but it is highly dependent on equipment quality and the precision of the technician [6].

AMH on the other hand, is not yet familiar to all family doctors and gynecologists, who would need to refer a woman to a fertility specialist for the test [5]. AMH level found to be lower in women over 40 year of age and higher in younger female with Polycystic ovaries (PCO) and polycystic Ovary Syndrome (P OCS) [6,15] therefore, AMH is considered to be more specific marker of ovarian response to gonadotrophins [9] and more significance fertility markers over other hormones such as FSH,E2 and antral follicle count (AFC) for treatment female infertility [16,17]. However, both AMH and FSH are still used as ovarian reserve tests [14] despite

that FSH test showed several obstacles [18,19] and it needs to be measured during early follicular phase [20-23].

Therefore AMH test believed to has advantages over FSH test [24-26], although AMH level shows variation in different blood samples for the same patient during the same menstrual cycle AMH can still show 80% sensitivity and 93% specificity to predict poor ovarian response at random and treatment can be monitor for optimal cycle [27,28]. The facts that AMH reported to show assays controversies [29-31] raise question mark about the possible role of AMH in assisted reproduction. Although other studies showed that levels of FSH and E2 were used as biochemical markers for assessment of low ovarian reserve for many years however, identification of AFC at later stage considered more reliable marker in assessment of the ovarian reserve where, Follicle count can be determined easily using high resolution sonographic systems [32-34].

Although difficulties were reported in obtaining AFC however, it has been recommended over basal FSH [32]. Thus, by some investigators AFC is considered as the first choice test [32,34]. FSH and AMH are two different hormones to predict ovarian reserve at two different stages of follicular development. FSH levels reflect antral and postantral follicular development while AMH values are representative of post primordial prenatal follicular pool [15]. Despite the use of both these 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 [15]. Therefore, some studies have been conducted to determine the frequency of concordance and discordance between AMH and other markers such as FSH levels in female infertility patients [35].

Conclusion

AMH test seems to be future reliable indicator over other hormone markers fork evaluating fertility potential and monitoring infertility treatment.

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