

Estimation of Anti Mullerian Hormone in Reproductive Age Group of Women of Bihar, and its Clinical Utility

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Conflict of interest: Nil

Abstract

Introduction: The measurement of circulating AMH levels has been applied to a wide array of clinical applications mainly based on its ability to reflect the number of antral and preantral follicles present in the ovary, which is seen to investigate & basis of this investigation for taking earlier fertility treatment to maximize the likelihood of a surgical pregnancy.

Material & Methods: A prospective randomized study was carried out on fifty women in the Gynaecological Department of Nalanda Medical College & Hospital, Patna Chemiluminescent Immunoenzymatic Assay Method is used.

Result: S. AMH level peaked before 25 years of age falling to a quarter of this peak by 40 years of age.

Discussion: AMH level is one measure of reproductive performance an international standard to AMH & improved assay validity are urgently needed to maximize the clinical utility of this very promising biomarker of ovarian function in large assay of clinical situation both in childhood & adulthood.

Keywords: AMH., Immunoenzymatic

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Introduction

In the ovary Anti Mullerian Hormone is produced by the granulose cells of early developing follicles & inhibits the transition from the primordial to the primary follicular stage.

A French endocrinologist discovered Anti Mullerian Hormone. It is a glycoprotein hormone belonging to the transferring growth factors Beta family whose key roles are in growth, differentiation & folliculogenesis. AMH levels are indication for the size of the growing follicle pool & considered as marker of ovarian ageing. Women are born with their life time supply of eggs and these gradually decreases in

both quality and quantity with age. The level of AMH in a women blood is generally a good indicator of her ovarian reserve. AMH levels decline with age hence decline in AMH levels may be the earliest marker of ovarian ageing. Levels of AMH in blood can help doctors estimate the number of follicles inside the ovaries. Therefore women egg number of follicle inside the ovaries therefore women egg count has strong correlation of serum AMH levels with AFC (Antral Follicles Count). It reflects the number of antral and preantral follicle present in the ovaries. A typical AMH level for a fertile woman is 2.0-4.0 ng/ml. Under 2.0 ng/ml is considered low

and indication of a diminished ovarian reserve. DOR is one of the major causes of infertility among women. AMH is secreted by pre-antral and antral follicles. It seems to inhibit the initial follicles recruitment & FSH stimulated follicle growth.

Physiology of AMH:

AMH was only isolated and purified in 1984 genes for AMH and its receptor more sequenced and cloned in 1986 and 1994 respectively. AMH has been predominantly known for its role in male sexual differentiation.

In women AMH expression is restricted to one cell type, the granulosa cells of the ovary. It starts around the 25th week of gestation continuing until menopause. AMH is expressed as soon as primordial follicles & its highest expression is observed in pre-antral and small follicles. AMH expression then decreases with the selection of follicles for dominance and is no longer expressed during FSH dependant stages of follicular growth (Except in the cumulus cells of pre ovulatory follicles) In healthy women the AMH level initially increases with early adulthood and then slowly decreases with increasing age until become detectable. It happens approximately 5 years before menopause when the pool of growing follicles is exhausted.

Materials and Methods:

The present study estimation of level of AMH in reproductive age group of women of Bihar has been carried out on fifty women attending the Department of Gynaecology, Nalanda Medical College & Hospital. On the basis of age and fertility their blood sample were taken.

Method:

AMH assay done by fully automated system using PARAMAGNETIC

PARTICLE CHEMILUMINESCENT IMMUNO-ENZYMATIC ASSAY.

Optimal Fertility – 4.0-6.8 ng/ml
Satisfactory Fertility – 2.2-4.0 ng/ml
Low Fertility – 0.3-2.2 ng/ml
Very low/ Undetectable – 0.0-0.3 ng/ml
High level - > 6.8 ng/ml

Results:

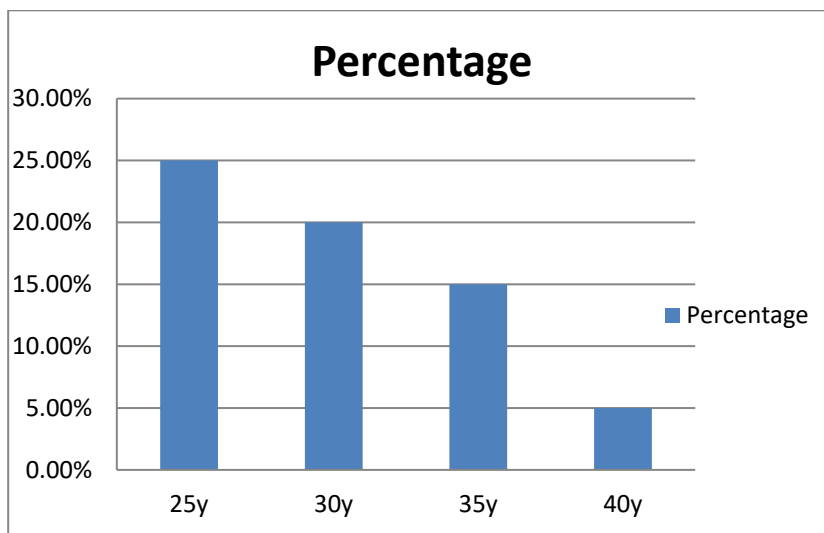
S. AMH level is now preferred as a biomarker to evaluate ovarian reserve in women. It is being considered a screening tool for women who want to preserve their fertility in some clinical situation.

Recently Steiner et al. Determined the extent to which biomarkers of ovarian reserve are associated with reproductive potential among late reproductive age women (age 33-44yrs). It acts as a useful marker of ovarian reserve. Anti Mullerian Hormone seems to be the best endocrine marker for assessing the age related decline of the ovarian pool in healthy women, thus it has a potential ability to predict future reproductive lifespan. However, recent research has also highlighted the use of AMH in the variety of ovarian pathological conditions including Polycystic Ovary Syndrome.

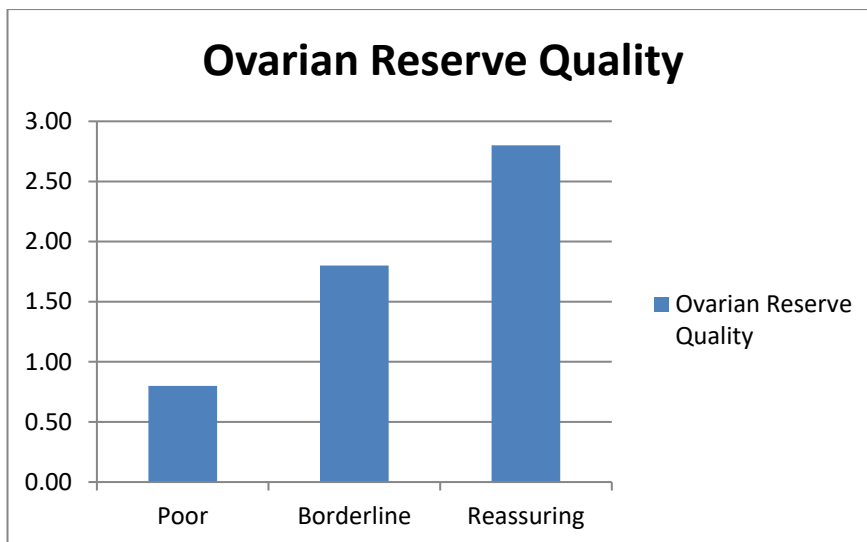
Fertility status by age:-

Age	S. AMH(ng/dl)
25yrs	5.4
30yrs	3.5
35yrs	2.3
40yrs	1.3
>43yrs	0.1

Above data shows that S.AMH level peaked by 25 years of age with mean AMH level halving by the 36 years and falling to quarter of the peak by 40 years. There are only very limited data on relationship between mean AMH and natural fertility at different stages and Fertility and chances of successful natural reproductive life, while it has a relationship to age at menopause.



The above data shows truth about natural infertility and age while women under 30 years have 25% chances of getting pregnant naturally. Each cycle that drops to 20% for women over 30 years. At the age of 40 years the chances of getting pregnant naturally each month is just 5%. Relationship between Anti Mullerian Hormone & Ovarian Reserve



AMH level may be useful in assessing the need for fertility preservation strategies. This test is also used to predict whether the patient will respond well to the treatment such as in-vitro fertilization (IVF). High level means more egg available and will respond better to treatment. Lower level of S. AMH means fewer eggs available and may not respond well to treatment.

Discussion

The serum concentration of Anti Mullerian Hormone has gained widespread clinical use as a surrogate marker for ovarian

reserve. It seems to be the best endocrine marker for assessing the age related decline of the ovarian pool in healthy women. Thus it has a potential ability to predict future reproductive life.

For the first time in female reproductive biology it is possible to measure the submerged part of the iceberg of follicle growth. An international standard for AMH and improved assay validity are urgently needed to maximize the clinical utility of this very promising biomarker of ovarian function in large array of clinical situation both in childhood and adulthood. AMH is

the best currently available measure of ovarian measure under a variety of clinical situation such as infertility treatment (specially IVF), the forecasting of reproductive lifespan ovarian dysfunction (Polycystic Ovarian Syndrome).

Recent research has highlighted the use of AMH in a variety of ovarian pathological condition including polycystic ovarian syndrome, Granular cell tumour and premature ovarian failure. Low AMH level is an indication of diminished ovarian reserve & high AMH level can signal polycystic ovarian syndrome.

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