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Original Research Article

Estimation of Anti Mullerian Hormone in Sub fertile Group of Woman of Bihar and A Comparative Analysis

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Abstract:

Introduction: Anti Mullerian hormone (AMH) estimation has become amongst the first line of investigation in patients presenting with infertility be it primary or secondary to identify. It is a sensitive biological indicator of ovarian reserve. Its level helps to categorise the fertility potential. AMH measurement helps to identify premature ovarian failure, polycystic ovary syndrome and hypogonadotropic hypogonadism.

Method: Our retrospective analysis study involves 60 females, in the age ranging from 17- 52 years, all being native of Bihar under investigation for infertility. Serum AMH estimation was done using fully automated immunoassay system Biomeurix VIDAS using Enzyme Linked Fluorescence Assay technology.

Result: Serum AMH level is found to be peak in the age group of 17-25 years and the mean is 3.88 ng/ml. In the age group of 35 -43 years the mean AMH is significantly low and just 0.728 ng/ml so for this age group the fertility expectations seems to be low.

Conclusion: Identifying with the pattern of fall of Serum AMH level in geographical regions and races could be of great help for the women and patients concerned with their fertility. Studies from different geographical areas could be considered for customisation of treatment and for preparation of reference range best suited to that particular population.

Keywords: Anti-Mullerian hormone, Bihar, Infertility

Introduction

Anti-Mullerian hormone (AMH) is a homodimeric glycoprotein hormone, which belongs to transforming growth factor – beta (TGF-β) family. It is secreted by the granulosa cells of the antral follicles in the ovary and is involved in regulation of folliculogenesis [1]. It shows minimal variability over a menstrual cycle and also between subsequent cycles indicating its absence in the gonadal-hypothalamic-pituitary regulatory feedback process [2,3].

AMH level shows a gradual increase in its level in females from first day of life to the age of 25 years. Afterwards its level has been found to decline gradually to become merely traceable/ undetectable at menopause/ ovariectomy. AMH estimation has become amongst the first line of investigation in patients presenting with infertility be it primary or secondary to identify and categorise the fertility potential. AMH measurement helps to identify premature ovarian failure, polycystic ovary syndrome and hypo gonadotropic hypogonadism. AMH level is found to be associated with pregnancy outcomes in many studies in assisted reproductive technology (ART) [4]. In recent studies it has been found that in Indian women ovarian ageing is six years faster as compared to Caucasian women5. About 1-2% of Indian women experience menopause between 29-34 years of age [5].

Understanding the serum AMH level trend in a particular area is important. As it could be of great help in taking fertility decisions and counseling. Awareness also needs to create about this hormone level as especially working and career women could have an informed decision about their fertility issues in time. Our retrospective analysis is focused at studying the trend of AMH level in female population of Bihar, (India) in different age groups ranging from 17- 52 years of age.

Material and Method

Our retrospective analysis study involves 60 females, in the age ranging from 17- 52 years, all being native of Bihar suffering either primary or secondary infertility or being evaluated for PCOS . The need for informed consent was deviated as the

samples were being processed at a reference laboratory and serum AMH estimation was done as part of routine screening. No identifier apart from age and AMH level is being used.

Serum AMH estimation is done using fully automated immunoassay system Biomeurix VIDAS using Enzyme Linked Fluorescence Assay technology. The clinically reportable range for AMH in our laboratory was set at 0.3-6.79 ng/ml.

The acknowledged AMH reference range taken according to European standards showed optimal fertility at 4-6.79 ng/ml, satisfactory fertility at 2.19-4 ng/ml, low fertility at 0.3-2.19ng/ml, very low below 0.3 ng/ml . The serum AMH level higher than 6.79 ng/ml could be favouring PCOS / Granulosa cell tumors.

Results

Serum AMH level is found to be peak in the age group of 17-25 years and the mean is 3.88 ng/ml. In the age group of 35 -43 years the mean AMH is significantly low and just 0.728 ng/ml so for this age group the fertility expectations seems to be low. Findings are summarised in table 1.

Table 1:

Age Group (in years)	N=60	Average/ Mean AMH Value (ng/ml)	Standard Deviation(±)
17-25	7	3.88	3.447
26-34	30	2.346	2.38
35-43	21	0.728	0.962
44-52	2	0.05	0.565

Discussion

Van Disseldorpet al. reported that AMH is a more accurate predictor of reproductive age than biological age alone [6]. AMH is substantially lower in healthy Indian women at all ages than their European counterparts [7]. Reproductive ageing differs between the females of different racial, ethnic and geographical regions. Jaffar et al in their study concluded that females in the age group of 22–30 years had significantly higher AMH levels in the North Indian population as compared to those in the South Indian population whereas in the age group of 33-41 year showed a significant higher serum AMH level as compared to comparable North Indian population [8].

In the study by Jaffar et al published in 2023 [8] the mean value of AMH in the age group of 22-30 years in females from North Indian population is 4.4 ng/ml, though in our study the value of AMH in the comparable age group is found to be 2.551 ng/ml. The mean value of AMH in the population of 31-35 years female in our study is 1.715 ng/ml which corresponds to the study of Jafar et al in the comparable age group. In the age group of 36-41 years female in our study the mean value of AMH is found to be 0.548 ng/ml as compared to 0.9 ng/ml in the study of jaffar et al in the comparable age group.

Conclusion

Serum AMH is independent of menstrual cycle phase and a better diagnostic tool and surrogate marker for ovarian reserve though its level varies in different ethnic groups, races and different geographical regions. Identifying with the pattern of fall of Serum AMH level in geographical regions and races could be of great help for the women and patients concerned with their fertility. Informed decisions on fertility issues could be taken more easily and with better precision. It could be of help in identifying and predicting the menopause.

More studies from different geographical areas could be considered being taken so that more customisation of treatment and its outcomes could be done. More trends about AMH level in different regions could be acknowledged in correlation with fertility.

As observed in indifferent studies from India as well as in our study, the AMH is substantially lower in healthy Indian women at all ages than their European counterparts[7]. This trend in AMH level invokes us for preparing more customized AMH reference range which could be more suitable for the population of that particular geographical region.

List of Abbreviation

AMH – Anti Mullerian Hormone
PCOS – Polycystic Ovarian Syndrome

References

1. Weenen C, Laven JSE, von Bergh ARM, Cranfield M, Groome N, Visser JA, et al. Anti-Mullerian hormone expression pattern in the human ovary: potential implications for initial and cyclic follicle recruitment. Mol Hum Reprod. 2004; 10(2):77–83.
2. Van Disseldorp J, Lambalk C, Kwee J, Looman C, Eijkemans MJ, Fauser B, et al. Comparison of inter- and intra-cycle variability of anti-Mullerian hormone and antral follicle counts. Hum Reprod. 2010; 25(1):221–227.
3. Ledger WL. Clinical utility of measurement of Anti-Mullerian Hormone in reproductive endocrinology. J Clin Endocrinol Metab. 2010; 95(12):5144–5154.

4. Lee TH, Liu CH, Huang CC, Hsieh KC, Lin PM, Lee MS. Impact of female age and male infertility on ovarian reserve markers to predict outcome of assisted reproduction technology cycles. Reprod Biol Endocrinol. 2009; 7:100.
5. Thomas MP. Ovaries of Indian women age six years faster than their Caucasian counterparts. . In: The Week; 2018. Availablefrom: https://www.theweek.in/leisure/lifestyle/2018/03/13/ovaries-indian-women-age-faster-ovarian-egg-reservesfalling.html.
6. van Disseldorp J, Faddy MJ, Themmen AP, de Jong FH, Peeters PH, van der Schouw YT, et al. Relationship of serum anti-müllerian hormone concentration to age at menopause.J Clin Endocrinol Metab 2008;93:2129-34.
7. Gromski P.S., Patil R.S., Chougule S.M., Bhomkar D.A., Jirge P.R., Nelson S.M.. Ethnic discordance in serum anti-Mullerian hormone in European and Indian infertile women. RBMO. 2022; 45(5)979-985.
8. Jaffar M., Ahmad S. N., Monica, Ashraf M., Shaik S. A., Asif M. Geographical Diversity in the Age Specific Anti Müllerian Hormone Levels in Infertile Women: A Hospital based Cohort Study. Journal of human reproductive sciences.2023; 16(1)29-35.