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Determination the lipid profiles and the impact of anti-mullerian hormone on the levels of ovarian reserve in infertile women

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Abstract

Background: Nowadays, there are many infertility problems in women, therefore methods should be accurate in estimating ovarian reserve.

Objective: To determine the levels of anti-mullerian hormone (AMH) and lipid profiles, and to examine the impact of AMH in determining the levels of ovarian reserve in infertile women.

Methodology: A case control study was conducted in Baghdad Governorate / (Al-Imameen Al-Kazimin Teaching Hospital) during the period from January to December 2021. A total of 135 women (Control, pregnant and infertile women with 45 each) were enrolled.

Results: Results revealed that the LH in control(6.75 ± 1.43) was significantly ($P<0.05$) higher than pregnant (4.29 ± 1.56) and infertile (3.28 ± 1.46)women. The prolactin, Hb, and FSH/ LH were significantly higher in pregnant as compared with other groups. The correlation coefficients between AMH and FSH, prolactin, FSH/LH, were significant.

Conclusion: The AMH/FSH ratio equal to 3 is a good indicator of ovulation in women. Blood levels of AMH may be a good indicator of the amount and quality of the ovarian follicle pool throughout pregnancy.

Keywords: AMH; FSH; LH; Lipid Profile; Infertile women

1. Introduction

Infertility can be caused by both men and women, or by both. The women's type is received the most attention in this investigation. A flawless ovarian reserve test that precisely measures a woman's reproductive potential does not exist yet. Because of the research's inconsistent findings, evaluating the usefulness of multiple ovarian reserve tests is challenging [1, 2].

The term "ovarian reserve" refers to a laboratory assessment of how many eggs a woman have available at any particular time. A woman's reproductive capabilities are determined by the amount of eggs she has remaining in her ovaries. The greater the number of eggs in a woman's egg bank, the higher her chances of becoming pregnant; on the other side, a low ovarian reserve suggests a reduced chance of being pregnant. It's also crucial to remember that ovarian reserve testing can only tell you how many eggs you have remaining, not how excellent they are [1, 3].

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Infertility in women may be caused by a number of circumstances. Problems with egg release from the ovaries are known as ovarian ovulation disorders. Hormonal issues, such as polycystic ovarian syndrome, are one of them. Ovulation issues may also be caused by hyperprolactinemia, or having too much prolactin, the hormone that causes breast milk production. Excessively high (hyperthyroidism) or overly low (hypothyroidism) thyroid hormone levels may interrupt the menstrual cycle and cause infertility. Excessive physical activity, food disorders, and cancer are all probable causes [4, 5].

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There are different types of test to check the ovarian reserve. In this research, we will discuss some of them, such as GnRH stimulation test (GAST), and Anti-Mullerian Hormone (AMH).

2. Material and methods

A case control study was conducted in Baghdad Governorate / (Al-Imameen Al-Kazimin Teaching Hospital) during the period from January to December 2021. A total of 135 women (Control, pregnant and infertile women with 45 each) were enrolled.

Blood samples were collected from all women to estimate AMH, FSH, LH, prolactin, fasting blood sugar (FBS), C-reactive protein (C-RP), platelet and HbA1c.

Statistical analysis

The SPSS 23 program was used to conduct statistical operations .One Way ANOVA and least significant post hoc test was used to assess the significant differences among means.P <0.05 is considered a significant. Correlation coefficient was estimated.

3. Results

Results showed the differences in age among groups were significant (P<0.05) (Table 1).

Infertile women showed the significant (P<0.05) highest mean of AMH followed by control then pregnant (Table 2). Concerning the FSH and LH, results revealed that the means of control (5.56 mLu/mL and 6.75 mLu/mL) were significantly (P<0.05) higher than that of pregnant and infertile women (Table 2). On the other hand pregnant group showed significant higher mean of prolactin as compared with other groups. Table 3 illustrated that the mean of FSH/LH ratio was significantly (P<0.05) higher in control (0.98) as compared with the other groups. In contrast, the AMH/FSH ratio was significantly higher in infertile group as compared with other groups.

Table 1 Means±SD of women

Groups	No	Age/years
Group AC	45	31.82± 6.44b
Group BP	45	35.11± 5.23ab
Group CI	45	38.13±6.85a

Means with a different letter are significantly different (P<0.05)

The results of hematological parameters indicated that the WBC, platelet, C-RP, FBS, and HbA1c was significantly (P<0.05) higher in infertile group as compared with the other groups whereas the mean value of Hb was significantly (P<0.05) higher in control group(Table 4).

Table 2 The Mean ± SD of some hormones

Groups	**AMH (ng/mL)**	**FSH mLu/mL**	**LH mLu/mL**	**Prolactin (ng/mL)**
Control	3.89 ±0.76b	5.56 ±0.10a	6.75±1.43a	15.9±2.70b
Pregnant	1.51 ± 0.97c	0.79 ±0.09b	4.29±1.56b	98.4±9.48a
Infertile	8.15 ±1.36a	0.98 ±0.05b	3.28±1.46b	14.2±2.91b

Means with a different letter are significantly different (P<0.05)

Table 3 The mean of FSH/LH and AMH/FSH ratio

Groups	**FSH/LH Ratio**	**AMH/FSH** Ratio
Control	0.98±0.01a	1.79±0.77b
Pregnant	0.13±0.04b	1.91±0.12b
Infertile	0.22± 0.08b	2.58±0.63a

Means with a different letter are significantly different (P<0.05)

In regards with the correlation coefficient, results showed that AMH significantly correlated with age (0.43), FSH(0.83), prolactin (0.50), FSH/LH ratio (0.82), and FBS(0.41) (Table 5).

Table 4 Some hematological parameters

Groups	**Hb (ng/dL)**	**WBC x106**	**Platelet mLu/mL**	**C-RP (ng/mL)**	**FBS (mg/dL)**	**HbA1c (ng/dL)**
Control	12.1±1.56a	8.98± 2.11b	211.5±36.5b	0.73±0.20b	91.0 ± 14.4c	4.67±1.01b
Pregnant	10.9 ±1.43b	9.96± 2.63b	257.2±45.3a	0.70±0.27b	102.6 ± 15.6b	4.71±1.24b
Infertile	12.4 ±1.54a	12.74± 3.10a	269.3±46.7a	0.82±0.39a	111.0 ± 17.1a	5.06±1.19a

Table 5 Correlation between AMH and Some Variables in all Case

	AMH	
Variables	**r**	**P-Value**
AMH - Age (years)	0.432*	< 0.05
AMH - FSH (mLu/mL)	0.839**	< 0.05
AMH - LH (mLu/mL)	0.017	N.S
AMH - Prolactin (%)	0.505**	0.05 >
AMH - Hb (mg/dL)	0.173	N.S
AMH - WBC (mg/dL)	0.022	N.S
AMH - Platelet (mg/dL)	0.537	N.S
AMH - C-RP (mg/dL)	0.015	N.S
AMH - FSH/LH (%)	0.821**	< 0.05
AMH - FBS (mg/dL)	0.410*	< 0.05
AMH - HbA1c (%)	0.161	N.S
AMH - AMH/FSH (%)	0.057	N.S

4. Discussion

The AMH/FSH ratio test is one of the recent evidence that we have studied from an analytical point of view, in which we search for the available evidence that accurately looks at predicting the excessive response of the ovaries to stimulating ovulation, and thus assessing the stage of ovulation and the chance of pregnancy. It seems that the FSH and LH test have a good discriminatory ability to know the size of the egg in women, and also through our study, the FSH/LH test can lead to predicting the rate of ovulation, but this idea still needs more studies. Furthermore, both AMH and FSH have clinical value, with an increased test rate during the ovulation period. At relatively medium levels, where our study indicated that the closer the AMH/FSH ratio equal to 3 is a good indicator of ovulation in women. As a result, blood levels of AMH may be a good indicator of the amount and the quality of the ovarian follicle pool throughout pregnancy [7] and this study agreed with our study. The function of AMH as an effective predictive factor in assessing the likelihood of pregnancy has been extensively addressed in the scientific literature over the last few decades [8].

AMH was shown to be linked with the number of oocytes and the number of fresh embryos [9, 10].

5. Conclusıon

The AMH/FSH ratio equal to 3 is a good indicator of ovulation in women. Blood levels of AMH may be a good indicator of the amount and quality of the ovarian follicle pool throughout pregnancy.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare no conflict of interest.

Statement of ethical approval

Ethical approval for this study was done.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Mallikarjuna, M. and Rajeshwari, B. V. 2015. Selected risk factors of infertility in women: case control study. International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 46: 1714-1720.

[2] Balen, A. H., Morley, L. C., Misso, M., Franks, S., Legro, R. S., Wijeyaratne, C. N. and Teede, H. 2016. The management of anovulatory infertility in women with polycystic ovary syndrome: an analysis of the evidence to support the development of global WHO guidance. Human Reproduction Update, 226: 687-708.

[3] Barbieri, R. L. 2019. Female infertility. In Yen and Jaffe's Reproductive Endocrinology pp. 556-581. Elsevier.

[4] Menon, S., Timms, P., Allan, J. A., Alexander, K., Rombauts, L., Horner, P. and Huston, W. M. 2015. Human and pathogen factors associated with Chlamydia trachomatis-related infertility in women. Clinical Microbiology Reviews, 284: 969-985.

[5] Hanson, B., Johnstone, E., Dorais, J., Silver, B., Peterson, C. M. and Hotaling, J. 2017. Female infertility, infertility-associated diagnoses, and comorbidities: a review. Journal of Assisted Reproduction and Genetics, 342: 167-177.

[6] Datta, J., Palmer, M. J., Tanton, C., Gibson, L. J., Jones, K. G., Macdowall, W. and Wellings, K. 2016. Prevalence of infertility and help seeking among 15 000 women and men. Human Reproduction, 319: 2108-2118.

[7] La Marca, A. and Sunkara, S. K. 2014. Individualization of controlled ovarian stimulation in IVF using ovarian reserve markers: from theory to practice. Human Reproduction Update, 20(1): 124-140.

[8] Gomez, R., Schorsch, M., Hahn, T., Henke, A., Hoffmann, I., Seufert, R. and Skala, C. 2016. The influence of AMH on IVF success. Archives of Gynecology and Obstetrics, 293(3): 667-673.

[9] Tehraninezhad, E. S., Mehrabi, F., Taati, R., Kalantar, V., Aziminekoo, E. and Tarafdari, A. 2016. Analysis of ovarian reserve markers (AMH, FSH, AFC) in different age strata in IVF/ICSI patients. International Journal of Reproductive BioMedicine, 14(8): 501.

[10] Tanbo, T. and Fedorcsak, P. 2017. Endometriosis associated infertility: aspects of pathophysiological mechanisms and treatment options. Acta obstetricia et Gynecologica Scandinavica, 966: 659-667.