Female Infertility (AMH and FSH) over the Age of 35 in the Dukagjini Region in the Republic of Kosovo

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Abstract

Background: Female infertility is a complex clinical condition affecting both sexes women and men and has a significant influence on their mental status, lifestyle and relationships between them. For all married couples around the world, the desire to give birth to a healthy child is emphasized and this information is also indicated in the United Nations Declaration on Human Rights, Article 16.1, which states that "men and women without any restriction on race, nationality or belief, have the right to marry and build a family".

Purpose of work: It is to determine the degree of female infertility of women over the age of 35. Work has been done in the Dukagjini Region in Peja, in the Republic of Kosovo.

Materials and methods: Sampling was conducted over a period of time from January 2014 until June 2017, a total of 189 samples, 139 samples for analysis and 50 samples for checks were collected. Measurement of hormone parameters was done with Roche Elecsys's 411 automatic analyzer. The importance of the presentation is at $p<0.05$.

Results: From the results, it is seen that all the patients taking the study have found that there are significant changes in the hormones taken in the study (AMH and FSH) between the working group and the control group ($p<0.00001$). From the study, it has been found that women over the age of 35 have an increase in FSH (>20), while having an AMH (<0.5) decrease.

Discussion: Our results and other similar studies indicate that the AMH serum level of the AMH hormone shows ovarian storage and a valid and reliable test for infertility treatment. FSH as a hormonal predictor of infertility is significantly lower than the AMH hormone and the combination of AMH and FSH was not significantly better than the AMH.

Conclusion: From this original scientific paper it can be concluded that the determination of the concentration of these two hormones (AMH and FSH) is of great importance as regards the determination of female infertility over 35 yrs of age. From the results of this paper, we have also gained significant values for the decision-making of the healthcare professional as to which IVF/ICSI procedure. In most patients in whom the AMH<0.50 and FSH>20 hormone values have been determined, it is recommended by infertility health professionals to use hormone stimulating therapy because ovarian reserves are poor, so without the stimulation therapy the possibility that these females getting pregnant is too small or almost impossible. From this study we have observed in 6 cases that patients who had AMH>4.0 during the ultrasound examination we found that we have polycystic ovary syndrome (PCOS).

Keywords: AMH; FSH; PCOS

Introduction

Female infertility is a complex clinical condition affecting both sexes women and men and has a significant influence on their mental status, lifestyle and relationships between them [1-4]. For all married couples around the world, the desire to give birth to a healthy child is emphasized and this information is also indicated in the United Nations Declaration on Human Rights, Article 16.1, which states that "men and women without any restriction on race, nationality or belief, have the right to marry and build a family". Anti-Müllerian Hormone (AMH) is a polypeptide, part of the growth factor -β (TGFβ). AMH is a gene located on chromosome 13 and its receptor is in chromosome 12 called AMHR2 [5,6]. In a healthy female fetus, this protein is detected in the umbilical cord. Measurement of AMP at different stages of life shows that AMH serum levels decrease over the first four years and then increase linearly over the next four years and its serum

levels will not change during puberty and adolescence. It is widely accepted that lowering AMH levels in serum is the first indicator to reduce ovarian follicular reserves which can be determined in the blood at any time of the menstrual cycle due to its stability [7,8]. AMH is an indicator of ovarian reserve and naturally has lower values in older women (>40 yrs) and higher values of women with polycystic ovarian syndrome (PCOS) [9,10]. It has been reported that FSH, E2 and AFC are used to evaluate ovarian reserves to determine appropriate strategies for treating female infertility by age, which becomes very substantial in recent years [10,11]. FSH should be measured only during the follicular phase [12-15]. AMH compared to FSH tests can be tested every day of the menstrual cycle [16,17].

Purpose of Work

It is to determine the degree of female infertility of women over the age of 35. Our work has been worked in the Albanian population in the Dukagjini Region in Peja, in the Republic of Kosovo.

Materials and Methods

Sampling was conducted over a period of time from January 2014 until June 2017, a total of 189 samples, 139 samples for analysis and 50 samples for checks were collected. The age of patients taken for analysis is 35-55 yrs, while the age of the patients taken for control group is 25-35 yrs. Also, significant differences were observed between the age group 35-45 yrs and 45-55 yrs. Hormone analysis was performed in Biolab-Zafi Laboratory in Peja, Republic of Kosovo. All patients received you: name, surname, year of birth, period of infertility (years, primary or secondary infertility) and blood collection for analysis. For the FSH hormone analysis, the collection of blood samples was made from the day 2-3 of the menstrual cycle, while for the analysis of the AMH hormone collection blood samples were collected on each day of the month. Measurement of hormone parameters was done with Roche Elecsys's 411 automatic analyzer. The importance of the presentation is at p<0.05 (Figures 1 and 2).

Results

	Working groups (139 patients) Average/Std.	Control groups (50 patients) Average/Std.	t-test	Significant p<0.05	S-significant N-no significant
AMH	0.44 ± 0.29	2.32 ± 0.86	7.685	<0.00001	S
FSH	23.99 ± 9.27	7.33 ± 2.33	6.515	<0.00001	S

Table 1: Presentation of acquired values of AMH and FSH hormones in age groups of 35 yrs of age in the Dukagjini Region in Peja in the Republic of Kosovo.
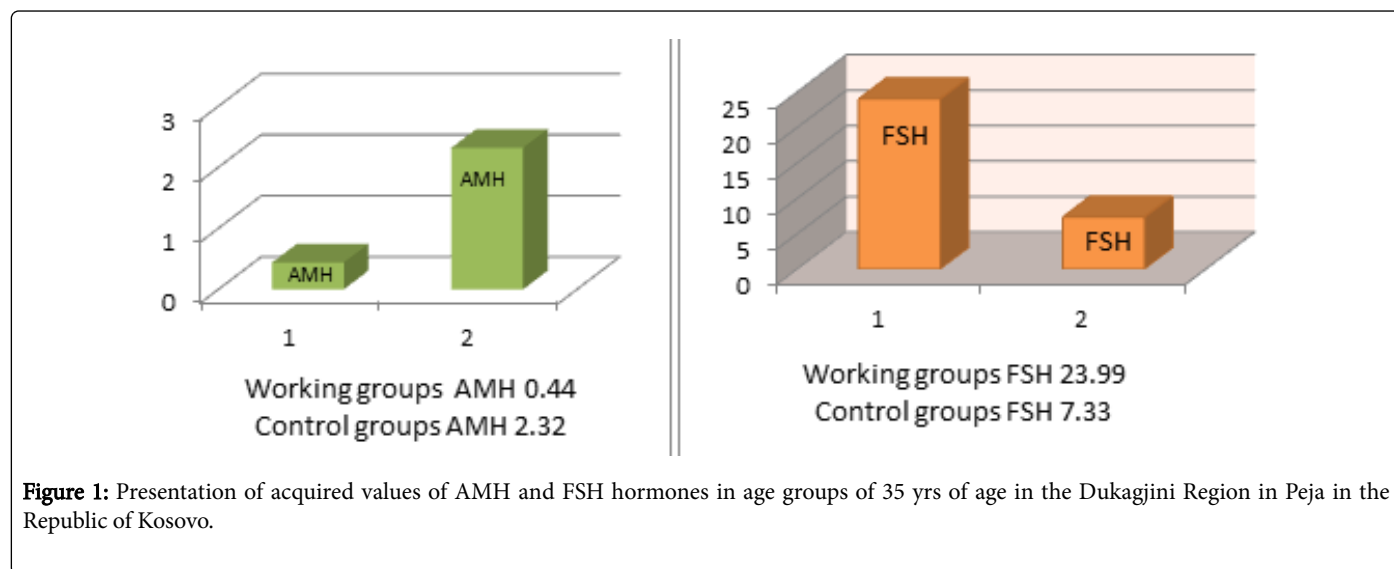

Figure 1: Presentation of acquired values of AMH and FSH hormones in age groups of 35 yrs of age in the Dukagjini Region in Peja in the Republic of Kosovo.

	Working groups (35-45 yrs) Average/Std.	Working groups (45-55 yrs) Average/Std.	t-test	Significant p<0.05	S-significant N-no significant
AMH	0.85 ± 0.67	0.41 ± 0.62	1.788	<0.042	S
FSH	18.55 ± 4.81	26.45 ± 7.54	3.215	<0.0017	S

Table 2: Presentation of acquired values of AMH and FSH hormones among the age groups of 35-45 yrs and 45-55 yrs old women in the Dukagjini Region in Peja in the Republic of Kosovo.

Figure 2: Presentation of acquired values of AMH and FSH hormones among the age groups of 35-45 yrs and 45-55 yrs old women in the Dukagjini Region in Peja in the Republic of Kosovo.
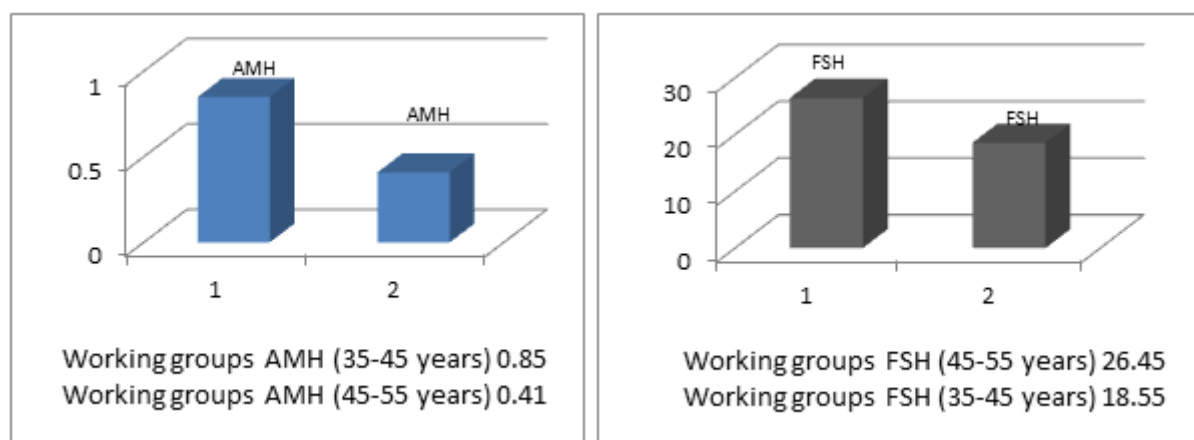
From the results obtained in Table 1, it is seen that all the patients taking the study have found that there are significant changes in the hormones taken in the study (AMH and FSH) between the working group and the control group ($p < 0.0001$). From the study, it has been found that women over the age of 35 have an increase in FSH (>20), while having an AMH (<0.5) decrease. Also, from the results obtained in Table 2, it is clear that there are significant differences between the groups studied between two age groups 35-45 yrs and 45-55 yrs ($p < 0.042$ and $p < 0.0017$) From this study we have found valid results that up to the age of 45 in most patients are preserved ovarian reserves with AMH values (>0.50) and FSH values (<20).

Discussion

Also in various studies, AMH is a reliable hormonal indicator to predict follicular quality in IVF and success in this procedure. On the other hand, Dewailly et al. showed in their study that AMH's value in the PCOS diagnosis remains controversial, but may replace AFC in the future [15]. Our results and other similar studies indicate that AMH serum AMH levels indicate ovarian storage and a valid and reliable test for infertility treatment. It is unclear whether the higher levels of AMH in PCOS are due to the higher prevalence of follicles or the result of a particular disorder in AMH synthesis that causes follicular growth in PCOS [16]. FSH as a hormonal predictor of infertility importance is significantly lower than the AMH hormone and the combination of AMH and FSH was not significantly better than AMH [17]. As a result, the rapid expansion of clinical use of AML as an ovarian marker should take into account the variability of measurements and the European Society for Reproduction and Human Embryology (ESHRE) has stated that the validity of hormone determination AMH has clinical relevance to show the response and ovarian [17].

Conclusion

From this original scientific material it can be concluded that the determination of the concentration of these two hormones (AMH and FSH) is of great importance regarding the determination of female infertility over the age of 35. From the results of this paper we have also gained significant hormonal values for the decision-making of the health professional, in which IVF/ICSI procedure. In most patients in the Albanian population of the Republic of Kosovo in which the Hormone Values of AMH<0.50 and FSH>20 are determined, it is recommended that infertility health professionals use hormone stimulating therapy because the ovarian reserves are weak, so without the therapy of the stimulus the possibility that these women become pregnant is too small or almost impossible. From this study we have observed in 6 cases that patients who had AMH>4.0 during ultrasound examination found that we have polycystic ovarian syndrome (PCOS). It should be noted that even nowadays, as a biochemical and hormonal marker in most clinical laboratories, only the determination of HSH, Lh, Prolactin, Testosterone, Progesterone, Estradiol, TSH, Ft3, Ft4 etc. But thanks to the development of contemporary technologies, the AMH hormone determination has been used as a very accurate determinant of the ovarian reserve of a woman.

References

1. Monga M, Alexandrescu B, Katz SE, Stein M, Ganiats T (2004) Impact of infertility on quality of life, marital adjustment and sexual function. Urology 63: 126-130.

2. Akhondi MM, Binaafar S, Ardakani ZB, Kamali K, Kosari H, et al. (2013) Aspects of psychosocial development in infertile versus fertile men. J Reprod Infertil 14: 90-93.

3. Luk BH, Loke AY (2014) The impact of infertility on the psychological well-being. Marital relationships, sexual relationships and Quality of life of couples: A systematic review. J Sex Marital Ther 11: 1-16.

4. Keramat A, Masoomi SZ, Mousavi SA, Poorolajal J, Shobeiri F, et al. (2014) Quality of life and its related factors in infertile couples. J Res Health Sci 14: 57-63.

5. Cate RL, Mattaliano RJ, Hession C, Tizard R, Farber NM, et al. (1986) Isolation of the bovine and human genes for Müllerian inhibiting substance and expression of the human gene in animal cells. Cell 45: 685-698.

6. Imbeaud S, Faure E, Lamarre I (1995) Insensitivity to anti-Mullerian hormone due to a mutation in the human anti-Müllerian hormone receptor. Nat Genet 11: 382-388.

7. Van Rooij IA, Broekmans FJ, Scheffer GJ, Looman CW, Habbema JD, et al. (2005) Serum anti-mullerian hormone levels best reflect the reproductive decline with age in normal women with proven fertility: A longitudinal study. Fertil Steril 83: 979-987.

8. Fanchin R, Schonäuer LM, Righini C, Frydman N, Frydman R, et al. (2003) Serum anti-Mullerian hormone dynamics during controlled ovarian hyperstimulation. Hum Reprod 18: 328-332.

9. La Marca A, Volpe A (2006) Anti-Müllerian hormone (AMH) in female reproduction: Is measurement of circulating AMH a useful tool? Clin Endocrinol (Oxf) 64: 603-610.

10. Durlinger AL, Gruijters MJ, Kramer P, Karels B, Kumar TR, et al. (2001) Anti-Müllerian hormone attenuates the effects of FSH on follicle development in the mouse ovary. Endocrinology 142: 4891-4899.

11. Barbakadze L, Kristesashvili J, Khonelidze N, Tsagareishvili G (2009) The correlations of anti-Mullerian Hormone, follicle-stimulating hormone and antral follicle count in different age groups of infertile women. Int J Fertil Steril 91: 2616-2619.

12. Esposito MA, Coutifaris C, KT Barnhart (2002) A moderately elevated day 3 FSH concentration has limited predictive value, especially in younger women. Hum Reprod 17: 118-123.

13. Broekmans FJ, Kwee J, Hendriks DJ, Mol BW, Lambalk CB (2006) A systematic review of tests predicting ovarian reserve and IVF outcome. Hum Reprod Update 12 : 685-718.

14. Wolff EF, Taylor HS (2004) Value of the day 3 follicle-stimulating hormone measurement. Fertil Steril 81: 1486-1488.

15. Toner JP, Philput CB, Jones GS, Muasher SJ (1991) Basal follicle stimulating hormone level is a better predictor of in vitro fertilization performance than age. Fertil Steril 55: 784-791.

16. La Marca A, Sighinolfi G, Radi D, Argento C, Baraldi E, et al. (2010) Anti-Müllerian hormone (AMH) as a predictive marker in assisted reproductive technology (ART). Hum Reprod Update 16: 113-130.

17. Anderson RA, Nelson SM, Wallace WH (2012) Measuring anti-Mullerian hormone for the assessment of ovarian reserve: When and for whom is, it indicated? Maturitas 71: 28-33.