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The selected pituitary gland hormones assessment in infertile women

Infertility is defined as the absence of the conception after one year of regular sexual intercourses, without any contraception. Primary infertility affects women who have never been pregnant, secondary infertility – women who were pregnant before (6). One of the basic tests evaluating the fertility is the serum hormones level assessment (2, 8, 9). Basing on the serum level FSH, LH and PRL assessment, the pituitary-hypothalamic system dysfunction may be diagnosed (1, 3, 7). In normal menstrual cycle, the value of LH/FSH proportion is around 1:1 (except ovulatory phase) (4). In pituitary-hypothalamic system disorder it is slightly scaled down to 0.5–0.6, in polycystic ovary syndrome (PCOS) grows up to 1.5–3.0 and has become as one of the most important diagnostic criteria (1, 3, 5, 7).

The aim of the study was the diagnosis and determination of the reasons for women's infertility measurement and assessment of the pituitary gland gonadotrophic hormones: follicle stimulating hormone (FSH) and luteinizing hormone (LH) in aspect of its influence on fertility.

MATERIAL AND METHODS

The clinical material consisted of a group of 267 patients suffering infertility, and treated at the Gynecologic Endocrinology Department of Medical Academy in Warsaw, between 1999 and 2003. 170 patients suffered primary infertility and secondary infertility – 97. All patients lived in Mazovian district. The patients' age ranged between 21 and 46 years (medium 29.6). The medium age of the first menstruation was 13.5 years.

The personal inquiry form, which was the basis for the clinical data, was performed. The data were obtained based on the medical records and interviews. The hormones serum concentration evaluation was performed with ELFA (enzyme-immunofluorescent) method. All tests were performed in the hospital laboratory, which has its own norms for each phase of the menstrual period, and for particular tests are presented as follows: during the follicular phase of the period FSH 3–15 mIU/ml, LH 1.5–10 mIU/ml. The hormone level assessment was performed during the 6–8 day of the menstrual period, in follicular phase. The obtained results were calculated and analyzed, using the t-Student test.

RESULTS

The FSH serum concentration ranged between 0.62 and 27.57 mIU/ml, medium 6.00. The FSH serum levels were statistically significantly higher ($p = 0.05$) in patients suffering primary infertility (medium 6.21), compared to secondary infertility (medium 5.63 mIU/ml) (table 1).

Table 1. The pituitary gland hormones LH and FSH level in mIU/ml during the 6–8th day of the menstrual period

Primary infertility n = 170		Secondary infertility n = 97		Total n = 267		Differences between groups
$\bar{x} \pm SD$	Me	$\bar{x} \pm SD$	Me	$\bar{x} \pm SD$	Me	
LH (mIU/ml)						
5.17 ± 3.18	4.50	4.78 ± 2.65	4.12	5.05 ± 3.00	4.30	nz
FSH (mIU/ml)						
6.21 ± 3,08	5.75	5.63 ± 2.03	5.40	6.00 ± 2.72	5.67	*

*p=0.05

x – the arithmetic means, SD – standard deviation, n – number of tested patients, nz – not statistically significant difference

The LH serum level ranged between 0.10 and 21.30 mIU/ml (medium 5.05) (table 1). LH serum level in patients suffering the primary infertility was not statistically significantly higher, medium 5.17 mIU/ml, compared to the secondary infertility, medium: 4.78 mIU/ml. The normal LH/FSH relation was ascertained: in 55.2 % was normal, elevated in 39.6 %, decreased in 5.2 % (table 2).

Table 2. The LH/FSH relation

LH/FSH relation	Number of tested patients	The percentage distribution (%)
LH/FSH > 1.5	106	39.6
LH/FSH = 0.5 – 1.5	147	55.2
LH/FSH < 0.5	14	5.2
Total	267	100.0

DISCUSSION

The serum level of pituitary gonadotrophin hormones FSH and LH was included in the normal range for the follicular phase of the menstrual cycle. The FSH serum concentration was statistically significantly higher ($p = 0.05$) in women suffering primary infertility, compared to secondary infertility. The LH serum level was not statistically significantly higher in women suffering primary infertility, compared to secondary infertility. The LH/FSH relation was elevated in 106 (39.6%) patients, which may indicate the polycystic ovarian syndrome. The normal LH/FSH relation was ascertained in 147 (55.2%) patients; however, in 14 (5.2%), the LH/FSH level was decreased. In Szczurowicz et al study (10), in women suffering the mechanical infertility, the medium values during the 8th day of period were: LH – 5.28 mIU/ml, FSH – 3.56 mIU/ml. In the present study the LH values were similar; however, FSH serum concentration was considerably higher.

CONCLUSIONS

1. The FSH and LH levels were higher in women suffering primary infertility.
2. In women suffering infertility, the elevated relation LH/FSH was ascertained.

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SUMMARY

The aim of the study was the diagnosis and definition of the reasons for women's infertility, measurement and assessment of the pituitary gland gonadotrophic hormones: follicle stimulating hormone (FSH) and luteinizing hormone (LH) in the aspect of its influence on fertility. The clinical material consisted of a group of 267 patients suffering infertility and treated at Gynecologic Endocrinology Department of Medical Academy in Warsaw, between 1999 and 2003. 170 patients suffered primary infertility and secondary infertility – 97. All patients lived in Mazovian district. The patients' age ranged between 21 and 46 years (medium 29.6). The personal inquiry form, which was the basis for the clinical data, was prepared. The data were obtained based on the medical records and interviews. The hormones serum concentration evaluation was performed with ELFA (enzyme-immunofluorescent) method. All tests were performed in the hospital laboratory. The obtained results were calculated and analyzed, using the t-Student test. The medium FSH serum concentration, during the 6–8 day of the menstrual cycle was 6.00 mIU/ml, LH 5.05 mIU/ml. The FSH serum levels were statistically significantly higher ($p = 0.05$) in patients suffering primary infertility (medium 6.21 mIU/ml), compared to the secondary infertility (medium 5.63 mIU/ml). LH level in patients suffering the primary infertility was also not statistically significantly higher, compared to the secondary infertility. The normal LH/FSH relation was ascertained in 147 (55.2%), elevated in 106 (39.6%), and decreased in 14 (5.2%) patients. The FSH and LH levels were higher in women suffering the primary infertility. In women suffering infertility, an elevated relation LH/FSH was ascertained.

Ocena wybranych hormonów przysadkowych u kobiet z niepłodnością

Celem pracy było rozpoznanie i ustalenie przyczyn niepłodności u kobiet, określenie i ocena poziomów gonadotropin przysadkowych: folitropiny (FSH) i lutropiny (LH) w aspekcie ich wpływu na płodność. Materiał kliniczny stanowiła grupa 267 pacjentek, leczonych w Klinice Endokrynologii Ginekologicznej AM w Warszawie w latach 1999–2003 z powodu niepłodności. Niepłodność pierwotną stwierdzono u 170, zaś niepłodność wtórną u 97 pacjentek. Badane pacjentki zamieszkiwały na terenie województwa mazowieckiego. Wiek badanych wahał się między 21 a 46 rokiem życia. Dla potrzeb badania opracowano kwestionariusz ankiety, za którego pomocą zebrano dane w oparciu o informacje uzyskane z analizy dokumentacji i rozmów z pacjentkami. Poziomy hormonów oznaczono za pomocą metody immunoenzymatycznej z zastosowaniem techniki ELFA (enzymoimmunofluorescencyjnej). Badania zostały wykonane w laboratorium szpitalnym. Uzyskane wyniki poddano obliczeniom i analizie statystycznej przy użyciu testu t - Studenta. Stężenia gonadotropin przysadkowych w 6–8 dniu cyklu miesięczkowego wynosiły średnio: FSH – 6,00 mIU/ml, LH – 5,05 mIU/ml. Stężenia FSH były znacząco wyższe ($p = 0,05$) u kobiet z niepłodnością pierwotną (średnio 6,21 mIU/ml) niż u kobiet z niepłodnością wtórną (średnio 5,63 mIU/ml). Poziomy LH u kobiet z niepłodnością pierwotną był również nieznacznie wyższy niż u kobiet z niepłodnością wtórną. Prawidłowy stosunek LH/FSH stwierdzono u 147 (55,2 %) pacjentek. Stosunek LH/FSH był podwyższony u 106 (39,6 %) pacjentek, natomiast u 14 (5,2 %) stosunek LH/FSH był obniżony. Poziomy hormonów FSH i LH były wyższe w grupie kobiet z niepłodnością pierwotną. U kobiet z niepłodnością stwierdzono podwyższony stosunek wartości LH/FSH.