The Gynecologic Endocrinology Department, Medical University of Warsaw
Departament of Hygiene, Medical University of Lublin

ELŻBIETA SOŁTYSIAK, ANDRZEJ BORZĘCKI

The serum prolactin level assessment in infertile women

Infertility is defined as the absence of conception, after one year of regular sexual intercourses, without any contraceptives. Primary infertility affects women who have never been pregnant; secondary infertility – women who have been pregnant before (6). One of the basic tests evaluating the fertility is the serum hormones level assessment (1, 8, 9). One of the most important tests is the prolactin serum level assessment. It has to be remembered that there may be some factors having impact on its concentration such as: stress, the psychotropic drugs intake, pituitary gland disorders, thyroid gland diseases, and the mammary nipples teasing. Prolactin also demonstrates round-the-clock hesitation with its night peak value between 3 and 5 o'clock in the morning. A high prolactin value has influence on the ovarian function, leading to menstrual disorders and infertility. The ovarian hormone excess leads to LH function deprivation and probably to the corpus luteum inefficiency (3, 4, 5, 6, 7, 10). The lack of ovulation, the shortening of luteal phase and irregular menstruations may be the clinical signs of elevated prolactin serum level (7). Elevated prolactin serum concentration up to 40 ng/ml leads to shortening of the secretory phase and insufficient function of the corpus luteum through the inhibitory prolactin influence on the estrogen production (2). The normal serum prolactin level in reproductive aged women ranges between 5 and 25 mg/l (4, 5).

The aim of the study was the recognition and definition of women's infertility cases, the designation and assessment of the night prolactin (PRL) secretion profile and the results introduction.

MATERIAL AND METHOD:

The study was performed at the Department of Gynecologic Endocrinology of Medical Academy in Warsaw. The clinical material was constituted of 255 patients suffering primary and secondary infertility, treated at the department between 1999 and 2003, living in Mazovian district. The medium age of the first menstruation was 13.4 years. The age ranged between 21 and 46 (medium 28.7) years. 166 patients suffered primary infertility and secondary infertility – 89 patients. The personal inquiry form, which was the basis for the clinical data, was prepared. The obtained data were based on the medical records and interviews. The night prolactin (PRL) profile at 22^{00}, 2^{00}, and 6^{00} o'clock, was performed. The hormones serum concentration evaluation was performed with ELFA (enzyme-immunofluoroscentic) method. All tests were performed at the hospital laboratory, which has its own norms for the PRL serum concentration: 1.3-25.0 ng/ml. The obtained data were calculated and statistically analyzed, using the t-Student test. The statistically significant were the differences with p value ≤ 0.05.

RESULTS

The prolactin serum level was assessed in 255 women, diagnosed because of infertility. The PRL serum concentration, measured at 22^{00} ranged between 0.50 and 121.73 ng/ml (medium 19.65), at 2^{00} ranged between 0.50 and 200.00 ng/ml (medium 41.69), at 6^{00} ranged between 2.50 and 154.10 ng/ml (medium 40.76) (table 1). Among the tested group, the PRL serum concentration over 25 ng/ml at 22^{00} was ascertained in 64 patients (25.1%), over 40 ng/ml at 6^{00} in 104 patients (40.8%). In patients suffering primary infertility, statistically significant (p < 0.05) higher prolactin serum concentration at 22^{00}, 2^{00} and 6^{00} o'clock was ascertained. In women suffering primary infertility, the flat course of the night PRL curve profile between 2^{00} and 6^{00} was observed (fig. 1).

Table 1. The night PRL profile in ng/ml

Measure time	Primary infertility n = 166	Secondary infertility n = 89	Total = 255
	x ± SD	x ± SD	x ± SD
Time: 22.00	20.61 ± 12.32	17.86 ± 11.46*	19.65 ± 12.07
Time: 2.00	43.81 ± 29.09	37.72 ± 18.27*	41.69 ± 25.95
Time: 6.00	43.79 ± 23.27	35.11 ± 17.43**	40.76 ± 21.77

*p<0.05   **p< 0.01

X – The arithmetical means, SD – standard deviation, n – number of patients
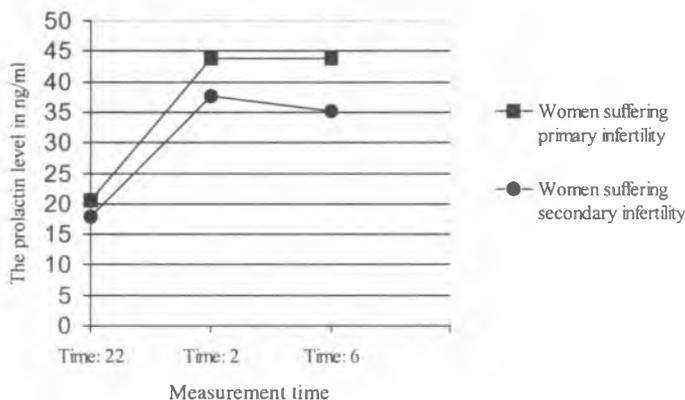

Fig. 1. Night PRL profile in women suffering primary and secondary infertility

DISCUSSION

The present study affirmed that the prolactin serum concentration level measured at 22^{00} was located at the upper range; however, at 2^{00} it was increased, and at 6^{00} o'clock its decreasing tendency was noticed. Skalba (5) in his study indicates the rising PRL serum level during the night time; however, the degree of this growth is not defined. In patients suffering primary infertility, the statistically significant higher serum PRL concentration (p < 0.05) during the day and night rhythm alike at 22^{00}, 2^{00} and 6^{00} o'clock was ascertained. The irregular course of the night PRL profile was observed in

women suffering primary infertility – the plane curve between 2^{00} and 6^{00} o'clock. The morning prolactin serum levels in women suffering primary infertility are statistically significantly higher (p < 0.01) compared to the women suffering secondary infertility. It may suggest more frequent pituitary disorders in women suffering primary infertility. Frequent PRL elevated serum level indicates that this is one of infertility reasons. Krzemiński at al. (2) in their study affirmed the serum PRL level lower than 30 ng/ ml in 53.3% of women, higher in 47.0% of women. Medium PRL level was 18.2 ng/ml. In the present study, a similar result was ascertained at 22^{00}, but higher serum concentration oscillations were noticed.

CONCLUSIONS

In women suffering primary infertility a statistically significant higher PRL serum concentration, compared to the women suffering secondary infertility, was ascertained.

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SUMMARY

The aim of the study was the recognition and definition of women's infertility cases, determination and assessment of the night prolactin (PRL) secretion profile and the results introduction. The study was performed at the Department of Gynecologic Endocrinology of Medical Academy in Warsaw. The clinical material was constituted of 255 patients suffering primary and secondary infertility, treated in the department between 1999 and 2003, living in Mazovian district. 166 patients suffered primary infertility and secondary infertility – 89 patients.The medium age of the first menstruation was 13.4 years. The age ranged between 21 and 46 (medium 28.7) years. The personal inquiry form, which was the basis for the clinical data, was prepared. The obtained data were based on the medical records and interviews. The hormones serum concentration evaluation was performed with ELFA (enzyme-

immunofluoroscentic) method. All tests were performed in the hospital laboratory, which has its own norms for the PRL serum concentration: 1.3–25.0 ng/ml. The obtained data were calculated and statistically analyzed. The PRL medium serum concentration measured at 22^{00} was 19.65 ng/ml at 2^{00} – 41.69 ng/ml, at 6^{00} – 40.76 ng/ml. In patients suffering primary infertility, the statistically significant (p < 0.05) higher prolactin serum concentration was ascertained. In women suffering primary infertility, a statistically significant higher PRL serum concentration, compared to the women suffering secondary infertility, was ascertained.

Ocena stężenia prolaktyny u kobiet z niepłodnością

Celem pracy było rozpoznanie i ustalenie przyczyn niepłodności u kobiet, oznaczeń i oceny poziomu profilu nocnego wydzielania prolaktyny (PRL) oraz przedstawienie wyników. Badania przeprowadzono w Klinice Endokrynologii Ginekologicznej Akademii Medycznej w Warszawie. Objęto nimi 255 pacjentek zgłaszających się do Kliniki w latach 1999–2003 z powodu niepłodności, zamieszkałych na terenie województwa mazowieckiego. Niepłodność pierwotną rozpoznano u 166 pacjentek, niepłodność wtórną rozpoznano u 89 pacjentek. Średni wiek wystąpienia pierwszej miesiączki wynosił 13,4 lat. Wiek badanych wahał się między 21 a 46 (średnio 28,7) lat. Dla potrzeb badań opracowano kwestionariusz ankiety, za pomocą którego zebrano dane w oparciu o informacje uzyskane z analizy dokumentacji i rozmów z pacjentkami. Oznaczeń poziomu hormonów dokonano za pomocą metody immunoenzymatycznej z zastosowaniem techniki ELFA (enzymoimmunofluorescencyjnej). Badania zostały wykonane w laboratorium szpitalnym, które ma ustalone własne normy dla stężenia PRL i wynosi 1,3–25,0 ng/ml. Uzyskane wyniki poddano obliczeniom i analizie statystycznej. Poziom PRL określony o godzinie 22.00 wynosił średnio 19,65 ng/ml, o godzinie 2.00 – 41,69 ng/ml, o godzinie 6.00 – 40,76 ng/ml. Istotnie wyższy (p < 0,05) poziom PRL stwierdzono u pacjentek z niepłodnością pierwotną. U kobiet z niepłodnością pierwotną stwierdzono znamiennie statystycznie wyższy poziom prolaktyny w porównaniu z kobietami z niepłodnością wtórną.