Influence Of Polycistronic of The Ovarian in Women with The Combined Presence of Infertility and Obesity on Changes in Insulin and Sex Hormones

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Abstract
In the work, women with polycystic ovaries and infertility, as well as women with polycystic disease with the combined presence of infertility and obesity were examined. In the blood of the examined women, a study was made of the indicators of insulin and sex hormones. As a result of the study, it was found that women with polycystic ovaries and infertility have pronounced changes in insulin and sex hormones in relation to women with a full pregnancy. At the same time, in women with polycystic ovaries and the combined presence of infertility and obesity, there are more pronounced changes in insulin and sex hormones, which is similar to women with full pregnancy and women with polycystic ovaries and infertility. These results demonstrate that in women with PCOS and infertility, as well as women with PCOS, infertility and obesity, there is a general trend in insulin and sex hormones. Also, these results show the possibility of studying insulin and sex hormones as markers for diagnosing women with polycystic ovaries in the combined presence of infertility and obesity, in relation to women with polycystic ovaries and infertility.

Keywords: polycystic ovaries, infertility, obesity, insulin, sex hormones, full pregnancy.

Currently, infertility remains one of the most urgent problems of modern medicine in all countries. This is due to its wide distribution, steady growth and influence not only on the medical, but also on the social and economic spheres of state activity [1]. A significant contribution to the problem of infertility is made by polycystic ovary syndrome (PCOS). It is believed that it is the cause of more than half of all cases of endocrine infertility (56.2%), and in the structure of the causes of infertile marriage, PCOS accounts for 20–22% [6, 11, 9, 10]. In the published literature, one can find different data on prevalence of PCOS. However, at present, most experts agree that the average prevalence of PCOS among women of reproductive age is 4-10% [11, 9, 2, 8, 4, 5]. This allows us to consider PCOS as one of the most common endocrine causes of infertility.

The pathogenesis of PCOS is complex, multicomponent and multifactorial with the participation of the central regulatory systems, as well as ovaries, adrenal glands and other factors in the pathological process, and has different mechanisms in patients with normal body weight, obesity, insulin resistance. Characteristic clinical manifestations of PCOS are oligomenorrhea, anovulation, infertility , obesity, excessive hair growth, acne, etc. With PCOS, the majority of obese patients had aggravated heredity: menstrual and reproductive disorders, and diabetes mellitus, thyroid pathology, and hypertension were more common. The vast majority of patients (90- 95%) have infertility due to anovulation. At the same time, when pregnancy occurs, it most often

occurs spontaneously in the 1st trimester. In the formation of hyperandrogenism, an important role belongs to adipose tissue, in which extragonadal synthesis of sex steroids occurs, which does not depend on stimulation with gonadotropins. Patients with PCOS are characterized by android (visceral) obesity. The severity of obesity is positively correlated with the level of testosterone in the blood [3].

In general, it is believed that PCOS occurs with the same frequency throughout the world, however, prevalence rates of the disease depend on the selected diagnostic criteria and characteristics of the population sample. Based on diagnostic criteria, the prevalence of PCOS among women of reproductive age ranges from 6-9% to 19.9%. The frequency of detection of the syndrome in women with menstrual irregularities ranges from 17.4% to 46.4%. PCOS occupies a leading place in the population of women with clinical manifestations of hyperandrogenism and is detected in 72.1-82% of cases, while among women with anovulatory infertility - in 55-91% of cases [7].

Purpose of the study: to study the effect of polycystic ovaries in women with the combined presence of infertility and obesity on changes in insulin

and sex hormones

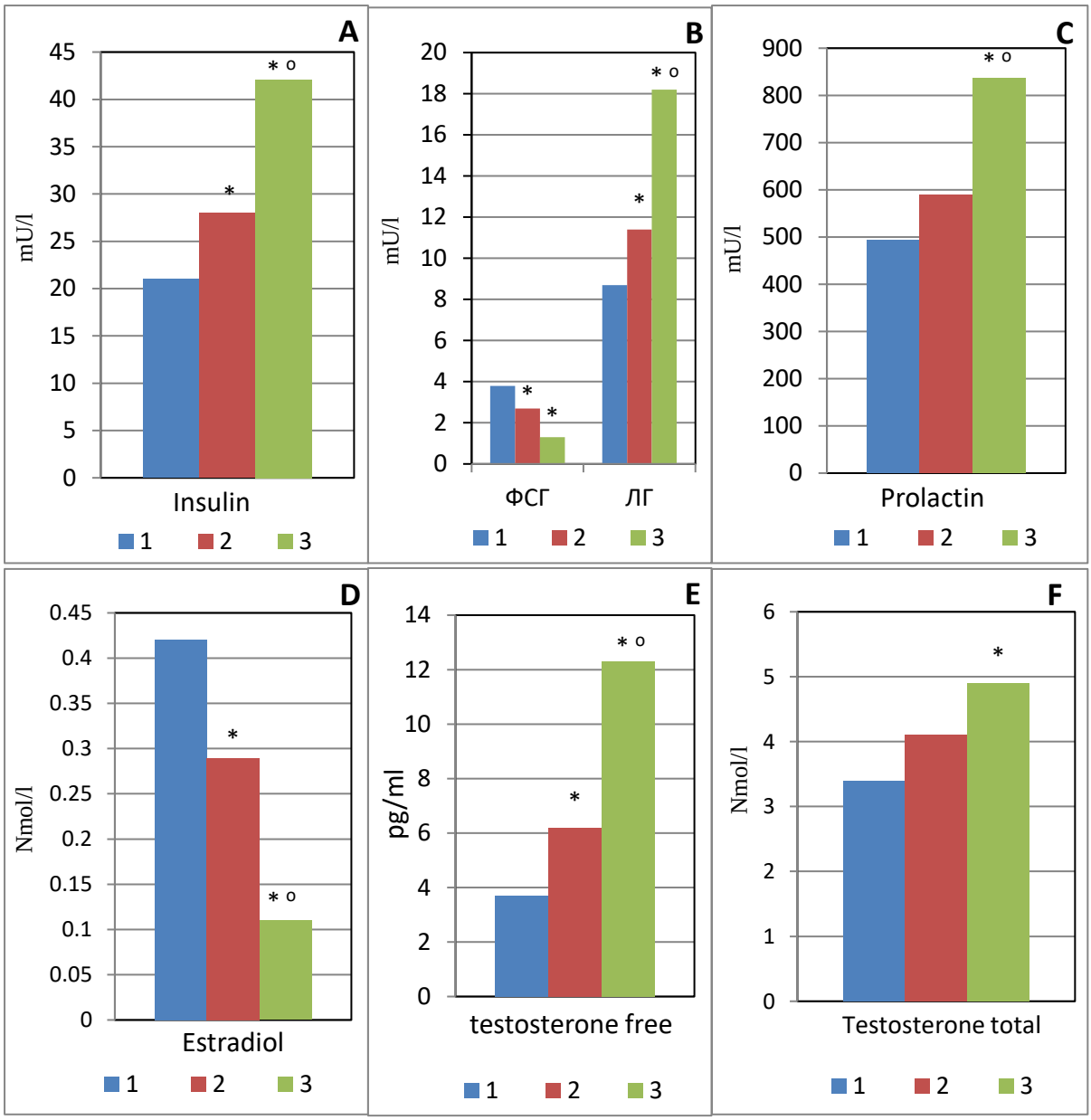
Material and methods. In the work, 60 women with polycystic ovaries and infertility, as well as 46 women with polycystic ovaries, infertility and obesity were examined. In the blood of the examined women, the parameters of insulin and sex hormones FSH, LH, prolactin, estradiol, total testosterone and free testosterone were studied by ELISA, using standard reagent kits "Vector-Best" and "CHEMA" produced in Russia.

Results. As a result of the studies, it was found that in women with a full pregnancy and full birth (control), the result of insulin in the blood was equal to 21.7 ± 1.8 mU / l. At the same time, a similar result in women with polycystic ovaries and infertility was 28.5±2.4 mU/l, which was significantly ($P<0.05$) 1.3 times higher than in women with full pregnancy. At the same time, in women with polycystic ovaries with the combined presence of infertility and obesity, this indicator was significantly higher than the results of women with a full pregnancy and amounted to 42.1 ± 3.7 mU/l, it was also significantly 1.5 times higher than the similar result of women with polycystic ovaries and infertility (Picture. 1A).

According to the results of the FSH study, it was found that this result in the blood of women with a full pregnancy was 3.8 ± 0.31 mU / l, while in women with polycystic ovaries and infertility, this indicator was at the level of 2.7 ± 0.24 mU /l, which was also significant ($P<0.001$), 1.4 times lower than in women with full pregnancy. At the same time, this result in women with polycystic ovaries with the combined presence of infertility and obesity was 1.3±0.12 mU/l, which was significantly ($P<0.001$) less than similar indicators in women with a full pregnancy. In addition, this indicator was significantly $P<0.001$, 2.1 times lower than the similar result in women with polycystic ovaries and infertility (Picture. 1B).

It was also found that the LH index in women withfull pregnancy, this indicator was 8.7 ± 0.72 mU / l, and inin women with polycystic ovaries and infertility, this result was 11.4±0.98 mU/l ($P<0.05$) and 1.3 times more than in women with full pregnancy. At the same time, in women with polycystic ovaries

with the combined presence of infertility and obesity, this result was at the level of 18.4±1.6 mU/l and was significantly (P<0.001) higher than similar data for women with full-fledged pregnancy. In addition, this PH result in these women was significantly 1.6 times higher than the results of women with polycystic ovaries and infertility (Picture. 1B).



1-women with full pregnancy and full birth (control). 2 - women with polycystic ovarian syndrome and infertility. 3 - women with polycystic ovary syndrome and obesity.

* - Significantly different values to the indicators of women with full pregnancy and full birth.

O -significantly different values to those of women with polycystic ovary syndrome and infertility.

Picture 1. Features of changes in the blood of insulin and sex hormones in women with polycystic ovaries in the combined presence of infertility and obesity.

When studying the indicators of prolactin in the blood in women with a full pregnancy, this figure was 493.8 ± 45.1 mU / l, in women with polycystic ovaries and infertility it was 589 ± 53.5 mU / l, which was 1.2 times and not significantly (P>0.1) higher than the results of women with full-fledged pregnancy. Nevertheless, the result of prolactin in women with polycystic ovaries and the combined presence of infertility and obesity was equal to 836±79.2 mIU/l and was significantly (P<0.001) higher than similar results in women with full pregnancy. Also, this result was significantly 1.4 times greater than that of women with PCOS and infertility (Picture.1C).

Also, from the results of the study of estradiol, it was found that in women with a full pregnancy and full birth, this indicator was equal to 0.42 ± 0.04 nmol / l. At the same time, in women with polycystic ovaries and infertility, this indicator was 0.29 ± 0.03 nmol/l, which was significantly (P<0.05) 1.5 times less than the values of women with full pregnancy. At the same time, the result of estradiolau in women with polycystic ovaries and the combined presence of infertility and obesity was 0.11±0.01 nmol/l, which was significantly (P<0.001) less than the similar result of women with full pregnancy. It was also significantly 2.6 times less than that of women with polycystic ovaries and infertility (Picture. 1G).

When examining women with full pregnancy, the result of free testosterone was 3.7±0.32 pg/ml. At the same time, in women with polycystic ovaries and infertility, this indicator was equal to 6.2±0.61 pg/ml and significantly higher than the values with full pregnancy. In addition, in women with polycystic ovaries and the combined presence of infertility and obesity, this indicator was 12.3 ± 1.1 pg / ml, which was significantly and significantly more than the similar result of women with a full pregnancy. This indicator was also significantly (P < 0.001) 2 times higher than the similar result of women with polycystic ovaries and infertility (Picture. 1D).

From the results of the study of total testosterone in women with full pregnancy, it was found that this result was 3.4 ± 0.31 nmol / l. At the same time, in women with polycystic ovaries and infertility, this indicator was 4.1 ± 0.38 nmol/l and 1.2 times was not significantly (P> 0.1) more than women with a full pregnancy. In women with polycystic ovaries, as well as the combined presence of infertility and obesity, this result was 4.9 ± 0.47 nmol/l, and was significantly higher than the similar result of women with full pregnancy. In addition, this indicator was not significantly 1.2 times higher than the similar result of women with polycystic ovaries and infertility (Picture. 1F).

The discussion of the results. From the data obtained, it was found that in women with polycystic ovaries and infertility, a significant increase in insulin, LH and free testosterone in the blood was revealed, in addition, a significant decrease in FSH and estradiol in relation to women with a full pregnancy. At the same time, these same women showed a non-significant increase in prolactin and total testosterone. In women with polycystic

ovaries, as well as in the presence of infertility and obesity, there was a more pronounced significant increase in blood levels of insulin, LH and free testosterone, as well as a significant decrease in FSH and estradiol, in addition, a significant increase in prolactin and total testosterone in relation to women with a full pregnancy . In addition, in women with polycystic ovaries with the combined presence of infertility and obesity, the levels of insulin, LH, prolactin and free testosterone were significantly higher, and FSH and estradiol were significantly lower than those of women with polycystic ovaries and infertility. At the same time, the results of total testosterone were not significantly higher than those of women with polycystic ovaries and infertility. Thus, in women with polycystic ovaries with the combined presence of infertility and obesity, in relation to women with polycystic ovaries and infertility, there is a more pronounced change in insulin and sex hormones. Therefore, indicators of insulin, LH and free testosterone, as well as FSH and estradiol can be used as diagnostic markers in women with polycystic ovaries in the joint presence of infertility and obesity, in relation to women with polycystic ovaries and infertility.

Conclusions: The data obtained showed that in women with polycystic ovaries and infertility, there were pronounced changes in the indicators insulin and sex hormones in relation to women with full pregnancy. At the same time, in women with polycystic ovaries with the combined presence of infertility and obesity, more pronounced significant changes in insulin and sex hormones were observed in relation to women with a full pregnancy. There were also significant changes in these indicators in relation to women with polycystic ovaries and infertility. These results show the possibility of studying insulin and sex hormones as markers for diagnosing women with PCOS in the presence of infertility and obesity in relation to women with PCOS and infertility.

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