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CONTENTS

MEDICINE

VETERINARY SCIENCE

PHARMACY

MEDICINE

NEW DATA IN THE ETIOLOGY OF A MULTIPLE PREGNANCIES

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ABSTRACT

In the present paper the examination of 28 pregnant women at the gestational age of 5 to 8 weeks, who were diagnosed twins has been carried out.
In addition to gonadotropins and estradiol the determination of inhibin B was conducted. A significant reduction of inhibin B was detected in pregnant women with twins in comparison with the control group that included 36 pregnant women with monofetal pregnancy.
The data obtained dictate the necessity of further research of inhibin B in arising multiple pregnancy.

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Introduction. Currently due to a wide-scale development of up to date reproductive technologies the frequency of multifetal pregnancy has been increased that makes up from 1.5 to 2.5 % [1, 2, 3]. There is no doubt about the fact that pregnancy and labor course in case of multiple pregnancy is associated with a number of complications both on maternal side (gestoses, premature labor, polyhydramnions and others) and on the side of fetus (fetoplacental deficiency, feto-fetal transfusion syndrome etc. [1, 3]. Hence, one of the research directions, to our mind, is to find an opportunity of prognosing and preventing multiple pregnancy complications.

According to Krasnopolsky V.I. et all., 2015, Sichinava L.G., 2014, Gregory L., 1998 multiple pregnancy can arise under the influence of age, endocrine changes, various hormonal preparations application (contraceptives, ovulation stimulators), and also the rise of multiple spontaneous ovulation and so on [2, 6, 9]. Dividing the fertilized ovum leading to monoovular twins can be induced by oxygen deficiency, acidity disturbance and ion composition medium, various toxic factors effect, and also owing to the implantation delay [5]. There are some investigations testifying to the fact that FSH increase promotes some ovum maturation in one follicle [5, 8]. This situation can be determined by genetics or arise as a result of the ovulation stimulators prescription, after the withdrawal of synthetic progestins or as a result of some other hormonal disturbance that have not been studied well enough so far.

It is known that in gametogenesis inhibin B plays a definite role [5, 10]. Inhibin B is a biologically active substance synthesizing itself in a follicle (in granulosis cells) and consisting of peptides α and βB-subunits. Inhibin B can inhibit FSH release and has both an endocrine and paracrine

effects [4]. It also shows the follicle growth in response to FSH stimulation, however its concentration does not depend on the follicle size [5]. In our time inhibin B is used to estimate an ovarian reserve.

It should be noted that the selection process of a dominant follicle begins in the middle of a lutein phase of the previous cycle. In this phase FSH reduction partially blockades gonadotropic stimulation of smaller antral follicles, and a dominant follicle goes on growing. When it reaches the stage of the secondary follicle, theca-cells arise in it and oocyte reaches the size of 120 nm in diameter. With developing theca-cells a follicle is provided with the blood supply, and granulosa that was formed in the primary follicle remains unvascularized. Due to the increased vascularization of theca-cells, the chosen coming of FSH to a dominant follicle is provided, in spite of reduction FSH in the blood serum. Granulosa cells secrete inhibin B, which blockades the meiosis process and in that way can prevent from maturing two ovum cells in one follicle. Taking into consideration the above-stated facts we found it expedient to study the content of inhibin B, FSH and estradiol in the blood serum in pregnant women with mono- and multiple pregnancy at early stages of gestation for the purpose of detecting possible differences in the content of the mentioned peptide hormone and its probable role in the multiple pregnancy rise.

Materials and methods. To achieve the mentioned purpose we examined 28 pregnant women at the term of gestation 5 to 8 weeks, who had twins according to the data of ultrasonic scanning (USS). They were included in the main clinical group. 36 healthy pregnant women at the same stage of gestation with monopregnancy were included in the control group. All the patients were at the age of 19 to 36 years. 15 (53.5 %) patients of the main clinical group were second pregnant. All these patients had one delivery in anamnesis. 13 (46.5 %) patients were first pregnant, that testifies to the fact that in the second pregnant women multiple pregnancy developed rather often. In 18 (64.3 %) women the birth of twins was noted in anamnesis, that confirms an inherited character of multiple pregnancy. 21 (75.0 %) patients were at the age of 29 to 36 years, 7 (25.0 %) were at the age of 19 to 28 years that is confirmed by the data concerning the fact that the multiple pregnancy frequency increases with the women age growth [6]. It should be noted that in the main group during carrying out a research the pregnancy course was without any complication. Taking into account that both in the main and control groups the percentage ratio of the first and second pregnant women at the age of 19 to 28 and 29 to 36 years didn't differ significantly, and also the results of clinico-laboratory and instrument research methods, confirming a physiological course of pregnancy in the main and control groups, one can state that the given research data can be considered to be randomized with respect to the received differences in the content of FSH, estradiol and inhibin B in case of multiple and monofetal pregnancy. All the pregnant women have been conducted a traditional clinico-laboratory and ultrasonic investigations. For the purpose to exclude concurrent somatic diseases all the pregnant women were consulted by a therapist, a surgeon, a neurologist and an endocrinologist. In all the patients pregnancy arose spontaneously. In order not to take into consideration the probable influence of various hormones on the content of inhibin B all the patients did not take synthetic progestins for half a year before pregnancy onset. All the pregnant women were fasting conducted the determination of FSH, estradiol and inhibin B in the blood serum. FSH and estradiol were estimated by an immunoenzymatic method with the application of the test –sets «Hema» (Russia). Inhibin B was estimated by immunoenzymatic method using the test sets ELISA IBL (Germany).

Statistic processing of the obtained data was carried out according to the generally accepted methods of variational statistics using statistic processing packets for Microsoft Office Excel 2007 for Windows 7c.

All the data are presented as a mean arithmetic ± standard deviation of the mean value. The comparison of mean values was made with the help of a bilateral t – criterion of Student for independent variables, and the difference between the groups was considered to be significant if the value was $p< 0.05$.

Research results. The content of FSH, estradiol and inhibin B in the main and control groups is presented in the table below.

Table 1. The content of FSH, estradiol and inhibin B in the examined women

Examined groups	FSH (IU/l)	Estradiol (ng/ml)	Inhibin B (ng/ml)
Main (group) (n=28)	4,80±0,63*	1974±376*	32,7±6,5*
Control (group) (n=36)	2,06±0,72	867±132	49,2±7,6

*- $p < 0.05$ as compared to the control group

Thus, the data of the table show, that in patients with multiple pregnancy there are significant differences in the content of FSH, estradiol and inhibin B. In particular, the concentration of FSH and estradiol in the blood of pregnant women with twins is almost 2 times higher than analogous indices in the control group, that agrees to the data of other investigations. At the same time the content of inhibin B in the main group is 1.5 times lower as compared to the control group ($p<0.05$). The data obtained testify to the fact that the reduction of inhibin B can probably lead to the increase of FSH as well as to active mitoses and meioses in a dominant follicle and hence to maturing more than two dominant follicles or two ovums in one follicle, and thus is one of the ethiological factors of multiple pregnancy onset. At the same time, studying the role of inhibin B in the multiple pregnancy rise dictates the necessity of further research in this direction. Most probably making a more careful study of the mentioned peptide into various phases of a menstrual cycle, and also retrospective investigation of the patients with multiple pregnancy will make it possible to work out the corresponding methods of preventing the multiple pregnancy rise.

Conclusions. The content of inhibin B is significantly reduced in patients with twins in comparison with monopregnant pregnancy. The obtained results show a possible ethiological role of inhibin B in arising multiple pregnancy and dictates the necessity of further research in this direction.

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