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MODERN ASPECTS OF OVARIAN STIMULATION IN OXIDATIVE STRESS CONDITIONS

Female infertility is an actual problem of our time, which makes the need for the development and improvement of assisted reproductive technology (ART). The most effective is recognized in vitro fertilization (IVF). The main and indispensable step in IVF is controlled ovarian stimulation (COS). It is important during stimulation of female gonad to ensure a high level of antioxidant defense system. In the body there are powerful levers of antioxidant effects. One of the most powerful components of the antioxidant system is melatonin.

The aim of our study is to improve the efficiency of ART by studying the activity of oxidative stress in follicular fluid during oocyte maturation during the COS, which is a step in the protocol of IVF.

Research Methods. The study involved 66 women of reproductive age with infertility without concomitant somatic pathology, who are allowed to use the techniques of assisted reproduction, and 33 healthy women, who applied for the purpose of egg donation and became the control group. 66 patients with infertility of various origins were included in the study if they had one of the criteria of “poor responders”: late reproductive age, receipt of 3 or less oocytes in previous cycles of IVF, decline in ovarian test

results (anti-Müllerian hormone (AMH) is less than 1.1 ng /ml, number of antral follicle count (NAF) is less than 5 (corresponding to the data of ultrasound).

By random division “poor responders” were divided into 2 equal groups. In group I (n=33), the average age was $36,61 \pm 4,54$ years, duration of infertility has made $8,64 \pm 4,41$ years, body mass index (BMI) = $24 \pm 3,54$. In group II (n=33), the average age was $35,30 \pm 5,13$ years, duration of infertility has made $9,97 \pm 5,16$ years, BMI = $24,26 \pm 5,34$.

Given the strong antioxidant effect of melatonin in order to reduce the harmful effects of oxidative stress on ripening oocyte, patients in this group received preventive course of hormone therapy: melatonin in tablets 3mg each. The scheme provided 3mg in the morning and 6mg in the evening for at least 4 weeks before the start of COS.

All patients according to a standard protocol had their level of functioning of hormones of the reproductive system, thyroid and adrenal glands determined. Upon receipt of oocytes during transvaginal puncture as determined by the levels of melatonin and 8-isoprostane in follicular fluid. Determination of melatonin (MLT) and 8-isoprostane was performed using Melatonin ELISA Kit, 8-isoprostane EIA Kit, IBL (Germany). The data

were statistically processed by calculating the arithmetic mean value, standard deviation. Statistical significance of differences between groups was determined using Student t-test.

Conclusions. The use of antagonists of gonadotropin releasing hormone agonists and antagonists of gonadotropin-releasing hormone for the purpose of inducing superovulation process leads to increased oxidative stress in follicular fluid which causes detrimental impact on the oocyte, thereby reducing the effec-

tiveness of IVF. 8-isoprostane is reliable indicator of oxidative stress and antioxidant system work, its content has an inverse correlation with the levels of MLT and the number of oocytes obtained after COS. Melatonin has a strong antioxidant effect, thereby increasing the number of oocytes obtained from patients with reduced ovarian reserve parameters. It may be considered appropriate to prescribe melatonin with antioxidant protective purposes in conjunction with the preparatory activities for the IVF.