Секция «Тезисы на английском языке»

A new method for assessment of oxidative status of follicular fluid in women undergoing in vitro fertilization

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Introduction

In vitro fertilization (IVF) is aimed at solving the problem of infertility. According to recent research, key attention is paid to the role of systemic oxidative stress in female infertility. However, local oxidative stress in follicles can also cause low effectiveness of IVF.

Objective

To find out what role local oxidative stress in follicles plays in oocyte maturation.

Tasks

To propose a complex method for assessment of oxidative status of follicular fluid including:

a) chemiluminescent measurement of the total antioxidant activity of follicular fluid;

b) spectrofluorometric assessment of the percent of oxygenated albumen in follicular fluid;

To put the method into practice for measurement of oxidative status of follicular fluid in undergoing IVF women with poor ovarian reserve and tubal factor infertility;

To correlate the results with embryo indicators of oocyte maturity.

Patients and methods

Follicular fluid of 32 women was obtained within the study: 16 samples from women with poor ovarian reserve (group A) and 16 samples from women with tubal factor infertility (group B, control). Follicles were collected by transvaginal puncture with ultrasonic inspection.

Antioxidant activity was measured by the chemiluminescent method with the use of luminol and 2,2-azobis(2-amidinopropane)dihydrochloride (ABAP) [1]. Total antioxidant activity (AOA) and AOA after adding uricase to the reaction mixture were assessed. Percentage of oxygenated albumen was determined by tryptophan fluorescence ([U+1D706] = 353 nm, [U+1D706]exc = 260 нм). The results were compared between two groups using the Mann-Whitney test ($p<0,05$).

Oocyte maturity was estimated by generally accepted criteria (rate I to IV).

Results

Empty follicle syndrome (EFS) was found in follicular fluid of 7 women of group A (44%): there was no mature oocyte found in the samples; all the group B samples contained mature oocytes. The study shows significant difference in total AOA (20,0 μmol - group B; 7,2 μmol - group A; in ascorbate units) and AOA after adding uricase (5,0 μmol; 3,5 μmol respectively). The percentage of oxygenated albumen in the EFS samples is significantly higher (58% and 19%).

Conclusion

Local oxidative stress affects the pathogenesis of empty follicle syndrome in infertile women. The percentage of oxygenated albumen in empty follicles is elevated in comparison with the samples containing mature oocytes, while antioxidant capacity in EFS samples is lowered by decreased level of uric acid.

Источники и литература

1) Алексеев А.В., Проскурнина Е.В., Владимиров Ю.А. Определение антиоксидантов методом активированнои хемилюминесценции с использованием АБАП // Вестн. Моск. Ун-та. Сер. 2. Химия. 2012. Т. 53. No 3. С.187-193.