

AUTOPHAGY AND GENETIC DISORDERS IN 3 PRONUCLEAR HUMAN EMBRYOS AT THE IN VITRO CULTIVATION STAGE

Khryapenkova, T.G.¹; Ilin, K.A.¹; Zinina, Y.M.¹; Nigmatullina, L.I.²; Bikanov, R.A.³; Plotnikov, E.Y.⁴

¹GMS IVF Clinic - Family Planning Center, ²Genetic laboratory First Genetics, ³Genetic laboratory First Genetics, ⁴A.N. Belozersky Institute of Physico-Chemical Biology Moscow State University

Abstract Body

Autophagy - the process of degradation of intracellular components. In this work, an attempt has been made to assess the involvement of autophagy in the development of an early embryo and the correlation between the fluorescence intensity of a specific dye, reflecting the autophagy, and the presence of aneuploidy, mosaicism, triploidy.

10 3 pronuclear human embryos obtained during the embryological stage were investigated. Gamete treatment, oocytes and embryos cultivation was performed under standard conditions. Staining was performed with Cyto-ID fluorescent dye. Genetic testing was performed using semiconductor sequencing technology (NGS) on the Ion S5TM platform.

In 5 embryos (N1,2,7,8,10), Cyto-ID fluorescence intensity was evaluated on days 1, 3 and 5 of development, and in the another 5 embryos only on days 3 and 5. We found a trend towards an increase in Cyto-ID fluorescence intensity from 1 day to 5.

Embryos N1,2,7,8,10, were subjected to genetic analysis. For the embryo N1, data in favor of polyploidy XXY were obtained. It also showed the greatest fluorescence intensity on days 1 and 5. Trisomy of chromosomes 2 and 16 correspond to the embryo N2. Trisomy of chromosome 4 corresponds to the embryo N7, and also mosaic form of trisomy of chromosome 22. For the embryo N8, XXY aneuploidy was detected. For the embryo N10, trisomy was detected on chromosome 9. Polyploidy cannot be excluded in female embryos (N2, 7, 10) due to limitations of the NGS method. We could not exclude reciprocal aneuploidies mosaicism, since whole embryo was sampled for NGS.

The tendency to increase the Cyto-ID fluorescence intensity reflecting the activity of autophagy, depending on the time of embryo cultivation, was shown. Genetic analysis of 5 embryos showed that all 3 pronuclear embryos were aneuploid.

The work was partially supported by the grant of the President of the Russian Federation MD-2065.2018.4