

Abstract

The principle of time-lapse system is based on the continuous sensing of the development of the pre-implantation embryo and the assessment of its morphology. This is advantageous in assessing the quality and implantation potential of embryos, which are subsequently evaluated according to certain established criteria. This gives the opportunity to select the highest quality embryo to be implanted into the mother's womb during embryo transfer. This system also allows us to detect any abnormalities in embryo development. This is very important, because the occurrence of abnormalities in early embryonic cell division is quite common. Morphological evaluation of embryos indicates a high incidence of tripolar mitosis during this early embryo development. The result of this division is three blastomers instead of two, which is associated with an irregular chromosome separation, each of them may contain a different number of chromosomes. In the case where conventional embryo observation is used to observe embryo morphology at longer intervals, it may be that the changes associated with tripolar mitosis are not detected at all, and such embryos appear to be falsely prosperous and are often selected for transfer. This can have serious consequences in the case of implantation, because these embryos are not only aneuploid but can lead to uniparental disomy.

In total, 429 patients were examined and 3579 embryos were evaluated morphologically using the time-lapse system. In this overall set, tripolar mitosis was positively identified in 95 (2,65 %) cases in 69 (16,08 %) patients. Subsequently, a statistical evaluation of the influence of selected parameters on the formation of tripolar mitosis was performed. The file was divided according to several criteria to compare the analysis result. Age factor, time of tripolar mitosis detection and media type were tested.

The results of this work was compared with the conclusions of the expert articles dealing with the detection of tripolar mitosis using the time-lapse system. The influence of the studied parameters on the formation of tripolar mitosis was not statistically proven.

Keywords: human embryo, time-lapse monitoring, assisted reproduction, tripolar mitosis