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The appearance of multinucleation at 2-cell stage does not adversely affect the implantation potential

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Study question:
Does the appearance of multinucleation (MN) at 2-cell stage adversely affect the implantation potential?

Summary answer:
The appearance of MN at 2-cell stage did not decrease the developmental rate to the blastocyst stage and the implantation rate after embryo transfer (ET).

What is known already:
It has been controversial whether the appearance of MN at 2-cell stage causes high chromomal abnormality and results in their pregnancy loss or not. A leading-edge technology enables us to observe morphological changes of embryo development without impairing its developmental competence.

Study design, size, duration:
We intended 27 patients who underwent ET on day 3 between September and December 2013 after obtaining the informed consent. After confirmation of normal fertilization, time-lapse images of 197 embryos were taken every 10 minutes using a time-lapse cinematography system (TLC, Vitrolife). Surplus embryos were cultured until day 6.

Participants/materials, setting, methods:
After day 3 ET and surplus embryo culture until day 6, the appearance of MN was confirmed using captured images. Effects of MN appearance at 2-cell stage on the development to the blastocyst stage and the implantation potential were compared retrospectively.

Main results and the role of chance:

The appearance of MN at 2-cell stage was confirmed in 97 embryos (49.2%) based on the observations of TLC images. The blastulation and the morphologically good blastocyst rates in MN embryos were 38% (31/82) and 26% (21/82), respectively. These values were almost the same levels as those obtained in non-MN embryos (blastulation rate: 46% (44/95) and good blastocyst rate: 26% (24/95)). The implantation rate of MN embryos (27%) was also similar to that of non-MN embryos (20%).

Limitations, reasons for caution:

Further studies are required to clarify the link between the appearance of MN at 2-cell stage and its chromosome constitution.

Wider implications of the findings:

This study provided new insights on the implantation potential of embryos which formed MN at 2-cell stage.

Study funding/Competing interest(s):

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Key words:

multinucleation at 2-cell stage, Time-lapse cinematography, implantation rate