The retrospective analysis of morphokinetics of transferred embryos from couples with different infertility forms

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Background: Good quality embryos must exhibit appropriate kinetics and synchrony of division. Embryos dividing either too slow or too fast may have metabolic and/or chromosomal defects. The objective of this retrospective study was to identify the morphokinetic parameters specific to embryos that were capable of implanting and pregnancy rates in couples with different infertility forms.

Material and methods: Using a 6% CO2gas IVF incubator with a built-in camera designed to automatically acquire images at defined time points, we have simultaneously monitored up to 364 individual embryos without removing the embryos from the controlled environment. Images were acquired every 15 min in seven different focal planes for at least 72 h for each embryo. We have monitored the development of transferred embryos from 157 couples undergoing their ICSI cycle. 39 couples (84 embryos) of control group were with normal ovulation, normospermia and tubal infertility (group I); 40 couples (88 embryos) were with pathospermia (group II); 36 couples (90 embryos) were with chronic anovulation and pathospermia (group III); 42 couples (102 embryos) were with chronic anovulation (group IV). Evaluated the time of first and subsequent cleavages as well as the time between cleavages.

Results. In group I, we observed the earliest beginning of the first division (25.20 ± 0.54 h after ICSI), the longest time of the first division (1,21 ± 0,28 h) and the highest frequency of occurrence of biochemical pregnancies (69.23%). For group II was characterized by the longest time between division to 2 cells and division to 3 cells (cc2 -12,80 ± 0,94 h) and the frequency of occurrence of biochemical pregnancies 55.00%. In group III it was recorded the longest time between division to 3 cells and division to 4 cells (cc3 -2,48 ± 0,35 h), the shortest time between division to 5 cells and division to 6 cells (cc5 -1,30 ± 0,13 h) and between division to 7 cells and division to 8 cells (cc7 -1,81 ± 0,18 h), the fastest division (time of division to 8 cells - 55,17 ± 0,55 h after ICSI ) and the frequency of occurrence of biochemical pregnancies 50.00%. In group IV it was marked the latest start of the first division (27.54 ± 0.37 h after ICSI), a very short time the first division (0,53 ± 0,04 h), the slowest division (time of division to 8 cells - 60,88 ± 1.07 h after ICSI) and the lowest frequency of occurrence of biochemical pregnancies (28.57%).

Conclusions: morphokinetics of transferred embryos from couples with different infertility forms differ. Embryos from couples with chronic anovulation divide most slowly, resulting in low pregnancy rate. Embryos from couples with pathospermia divide compared with control to 5th of blastomere slower and 6
to 8 faster while the pregnancy rate was not significantly different from that in the controls. Embryos morphokinetics from couples with a combination of chronic anovulation and pathospermia different by asynchronous and lower division lasting for 8 blastomeres, which is also accompanied by a low pregnancy rate.