

Type of culture media does not affect embryo kinetics: a time-lapse analysis of sibling oocytes

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Submitted on August 5, 2012; resubmitted on November 5, 2012; accepted on December 12, 2012

STUDY QUESTION: Are the morphokinetics of growing embryos affected by the type of culture media utilized?

SUMMARY ANSWER: Morphokinetic parameters used for embryo selection are not affected between the two different concept culture media analyzed.

WHAT IS KNOWN ALREADY: Studies on the effect of culture media on human embryos have focused on evaluating different in-house and commercially available media as well as comparing outcomes among different commercial media. Nonetheless, the evaluation of embryo development in these studies was based on static observations and very little is known from a dynamic point of view.

STUDY DESIGN, SIZE, DURATION: Prospective cohort study, October 2010 and April 2011.

PARTICIPANTS/MATERIALS, SETTING, METHODS: University-affiliated infertility center. Patients undergoing egg donation ($n = 75$) in which embryos were cultured with two different types of media in a time-lapse system. Embryo development was analyzed with time-lapse imaging for single step media (Global[®]) and sequential media (Sage[®] Cleavage). Variables studied included the timing to two cells (t_2), three cells (t_3), four cells (t_4) and five cells (t_5) as well as the length of the second cell cycle ($cc_2 = t_3 - t_2$) and the synchrony in the division from two to four cells ($s_2 = t_4 - t_3$). Implantation and clinical pregnancy rates were also analyzed.

MAIN RESULTS AND THE ROLE OF CHANCE: No statistically significant differences were observed between the two media for all the variables analyzed. When analyzing the percentage of embryos falling within the optimal ranges proposed for s_2 , cc_2 and t_5 , we did not find significant differences between the two media. Pregnancy and implantation rates were similar for the three types of transfers: 48.0% (CI 95% 28.4–67.6) and 42.0% (CI 95% 22.5–61.4) with Global media; 58.8% (CI 95% 35.4–82.2) and 38.2% (CI 95% 15.0–61.4) with Cleavage media; and 58.1% (CI 95% 40.7–75.4) and 37.1% (CI 95% 22.1–52.1) with mixed transferred, respectively. Multiple implantations (twins) were also similar among the three groups, with 24.0% (CI 95% 9.3–45.1) for transfers with embryos cultured in Global media, 17.6% (CI 95% 3.7–43.3) for transfers with embryos cultured in Cleavage media and 22.5% (CI 95% 9.5–41.0) with mixed transfers.

LIMITATIONS, REASONS FOR CAUTION: The study was not powered to test differences in pregnancy rates between the two culture media, as this was not the hypothesis tested. Results are based on observations with embryos from oocyte donors and need to be repeated with embryos from infertile patients of different ages.

WIDER IMPLICATIONS OF THE FINDINGS: The absence of differences in morphokinetics between two different media concepts validates the algorithm for embryo selection in diverse culture conditions.

STUDY FUNDING/COMPETING INTEREST(S): No specific funding was obtained for this study; it was solely funded by IVI. None of the authors have any economic affiliation with Unisense Fertiltech A/S but IVI is a minor shareholder in Unisense Fertiltech A/S.

TRIAL REGISTRATION NUMBER: Not applicable.

Key words: embryo kinetics / culture media / time-lapse