TIME-LAPSE SYSTEM ASSESSMENT OF PHASE-1 AND PHASE-2 EARLY CLEAVAGE ON 3-DAY EMBRYO QUALITY

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Objective: To compare 3-day embryo quality between phase-1 early cleavage embryos, and phase-2 early cleavage embryos using time-lapse system.
Methods: 959 embryos from 109 patients were analyzed for 3-day embryo quality using time-lapse system. Phase-1 early cleavage embryos were defined as embryos reaching 2-cell stage before 23 hours after intracytoplasmic insemination (ICSI), or before 25 hours in case of conventional insemination. Phase-2 early cleavage embryos were defined as embryos reaching 2-cell stage within 23 to 25 hours after ICSI, or within 25 to 27 hours in case of conventional insemination. 2-cell cleavage time after insemination was observed, and recorded by embryoscope™ (Unisense Fertilitech). 3-day embryo quality was evaluated at 63-65 hours after IVF or ICSI, and was graded based on morphology, and number of blastomeres, and the percentage of fragmentation. Each embryos were classified into four categories (A, B, C, D), where category A being the best quality, and D being the worst according to 2011 Istanbul consensus workshop on embryo assessment.
Results: Total number of embryos analyzed was 959. Of the 959 embryos 140(14.6%) embryos were classified as phase-1 early cleavage, 180(18.8%) embryos were classified as phase-2, and 639(66.6%) embryos as non-early cleavage embryos. On 3-day embryo transfer, 64(45.7%) phase-1 early cleavage embryos were classified as category A, 53(37.9%) were classified as category B, 18(12.9%) were classified as category C, and 5(3.5%) were classified as category D. Among phase-2 early cleavage embryos 67(37.2%) were classified as category A, 73(40.6%) were classified as category B, 27(15%) were classified as category C, and 13(7.2%) were classified as category D. ($P<0.348$)
Conclusion: Phase-1 early cleavage embryos showed better embryo quality compare to phase-2 early cleavage embryos. But statistical significance revealed no difference between Phase-1 and phase-2. We believe detailed evaluation of early cleavage embryos may be critical in selection of good quality embryos. Also breaking down early cleavage into 2 phases will help differentiate good quality embryos among early cleavage ones. Further study on implantation rate, clinical pregnancy rate, and live birth rate with these embryos is expected in near future.