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Correlation study between AI-based embryo evaluation system iDAScore Version 2 and morphological assessment

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Objective
This study evaluated the correlation between the AI-based embryo evaluation system iDAScore Version 2 (iDA2) and conventional morphological assessments, as well as time-lapse observation indicators. Additionally, we investigated the relationship between iDA2 scores and ongoing pregnancy rates to assess the utility of AI-based embryo evaluation.
Methods
A total of 392 cycles of single blastocyst transfers following freeze-all procedures after oocyte retrieval, conducted from January to August 2024, were analyzed with patient consent. For Day 3 embryos, the correlation between iDA2 scores and two factors was evaluated: (1) normality of the first and second cleavage, and (2) achievement of the 8-cell stage. For blastocysts, the relationship between iDA2 scores and embryo age (Day 5 development) as well as Gardner classification (ICM, TE, BL3-6) was examined. Pearson correlation analysis and logistic regression were used for statistical analysis.
Results
For Day 3 embryos, iDA2 scores showed a significant positive correlation with both normality of the first and second cleavage ($r=0.58$, $P<0.01$) and achievement of the 8-cell stage ($r=0.45$, $P<0.01$). In blastocysts, iDA2 scores were significantly associated with Day 5 development (odds ratio: 1.76, 95% CI: 1.49-2.08, $P<0.01$) and TE grade (odds ratio: 2.04, 95% CI: 1.72-2.42, $P<0.01$). A positive correlation was also observed with ongoing pregnancy rates (odds ratio: 1.20, 95% CI: 1.05-1.36, $P<0.01$).
Conclusion
iDA2 demonstrated a significant correlation with conventional morphological evaluation indicators, suggesting its utility in embryo assessment. The ability of iDA2 to numerically integrate multiple evaluation criteria may facilitate a unified understanding among patients, physicians, and embryologists.