

PREDICTING PREGNANCY TEST RESULTS AFTER EMBRYO TRANSFER BY IMAGE FEATURE EXTRACTION AND ANALYSIS USING MACHINE LEARNING

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Abstract Body

Objective: To assess pregnancy predictive value using both embryo morphology and patient characteristics with an automated static digital image analysis system utilizing artificial intelligence. **Design:** Retrospective morphometric study to evaluate an automated static digital image-processing algorithm. **Materials and methods:** We employed two high-quality databases with known pregnancy outcomes (n = 221). We created a system consisting of different classifiers that is feed novel morphometric features extracted from the digital micrographs, along with other non-morphometric data to predict pregnancy. It was evaluated using five different classifiers: probabilistic bayesian, Support Vector Machines (SVM), deep neural, decision tree, and Random Forest (RF), using cross-validation to assess the model's generalization capabilities. **Results:** In the database A, the SVM classifier achieved an F1 score of 0.74, and AUC of 0.77. In the database B the RF classifier obtained a F1 score of 0.71, and AUC of 0.75. **Conclusions:** Our results suggest that the system is able to predict a positive pregnancy test from a single digital image, offering a novel approach with the advantages of using a small database, being highly adaptable to different laboratory settings, and easy integration into clinical practice.

Abstract image

