Are there non-invasive markers in human oocytes that can predict pregnancy outcome?

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Abstract

Predictive criteria for selection of the best embryo for single embryo transfer remain elusive. This study aimed to determine if non-invasive markers in human oocytes, detectable using polarized light microscopy, can predict pregnancy outcome. Twenty-two pregnancy-producing oocytes from 19 patients had their morphological features compared with 30 oocytes from 19 age-matched patients whose transfer did not result in a pregnancy. Both pregnant and non-pregnant patients had similar numbers of oocytes collected (average: 11.9 ± 2.8 versus 11.3 ± 2.9) and similar fertilization rates (70.1% versus 69.6%). All embryos transferred were 4-cell cleavage-stage on day 2 with <10% fragmentation. Meiotic spindles were examined at 39–40 h following human chorionic gonadotrophin administration for spindle normality, length, density and angle from first polar body. There was a significant difference in spindle normality in oocytes in the pregnant patients compared with oocytes in the non-pregnant patients (100% versus 33%, P < 0.001). Spindle density was significantly higher in those oocytes resulting in pregnancy (3.0 ± 1.23 nm versus 2.5 ± 0.7 nm, P = 0.02). These oocyte markers may provide a useful non-invasive tool in the selection of the embryo most likely to produce a pregnancy.

Keywords: ICSI, meiotic spindle, PolScope, pregnancy outcome