

## The Impact of Embryo Morphokinetics on Ploidy and Implantation Rates

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### ABSTRACT

**Objectives:** Dynamic embryo monitoring with time-lapse imaging can potentially improve the selection of embryo(s) for implantation. This study aims to evaluate the relationship between KIDScore™ D5 decision support tool with embryo ploidy and implantation rates. **Methods:** A total of 1391 embryos derived from ICSI cycles from August 2017 to May 2018 were included in this observational study. The morphokinetic development of embryos was examined using the time-lapse system Embryoscope® (Vitrolife). Following extended culture to blastocyst, trophoctoderm biopsy was performed followed by chromosomal evaluation using Next Generation Sequencing (NGS) (VeriSeq Protocol, Illumina). The embryos were then analysed in 3 groups based on the KIDScore™ D5: Low (score 1.0-5.9), Average (score 6.1-7.9) and High (score 8.0-9.9). The linear relationship between KIDScore™ D5 and ploidy as well as implantation rates was analyzed using Pearson test (SAS software v.9.3, USA). **Results:** The euploid rates for embryos with Low, Average and High KIDScore™ D5 were 49.6%, 55.5% and 63.5% respectively ( $p < 0.01$ ). The corresponding rates for aneuploid embryos were 37.1%, 30.7% and 20.5% respectively ( $p < 0.01$ ). Among euploid embryos, the implantation rates for those with Low, Average and High KIDScore™ D5 were 58.3%, 66.1% and 72.4% respectively ( $p < 0.01$ ). **Conclusions:** In this cohort, a higher KIDScore™ D5 is significantly co-related with euploidy. Also, among euploid embryos a higher score is significantly correlated to a higher implantation rate. This study suggests that embryo morphokinetics can play a role in selecting the most optimal embryo(s) in non-NGS cycles and further delineate those euploid embryos post-NGS that has the highest implantation potential.

## The Impact of Morphology of Euploid Blastocysts on treatment Outcome

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### ABSTRACT

**Objectives:** Studies have shown a correlation between morphology and euploidy with poor quality blastocysts having a higher aneuploidy rate. A study to compare pregnancy outcomes after euploid blastocyst transfers with different blastocyst morphology was performed. **Methods:** All vitrified-warmed transfers of euploid blastocysts following Pre-implantation Genetic Screening (Veriseq Protocol, Illumina) between January 2016 – April 2018 were included in this retrospective study. The blastocysts were transferred in an artificially controlled cycle. All blastocysts were divided into three groups – Good (an inner cell mass (ICM) and/or trophoctoderm (TE) grading of A), Fair (B grade ICM and TE) and Poor (C grade in the ICM and/or TE). Clinical pregnancy rates (CPR), implantation rates (IR) and miscarriage rates (MR) were compared between the groups. **Results:** 291 blastocysts were transferred in 273 cycles of which 164 implanted. 138 resulted in ongoing pregnancies or live births while 26 miscarriages were reported. The CPR was 60.0%, 58.41% and 40.0% for Good, Fair and Poor quality blastocysts respectively. Meanwhile, the IR for the three groups were 57.14%, 59.17% and 41.94%. The MR was 19.23%, 16.67% and 0.0%. There was no significant difference among the groups. **Conclusions:** There was a trend towards lower clinical pregnancy and implantation rates when poorer quality blastocysts were transferred. However, poor quality euploid blastocysts are able to implant albeit at a lower rate. As such, all poor quality blastocysts should be considered for biopsy, especially when there are no other blastocysts available.