

## **EMBRYO MORPHOLOGY AND DEVELOPMENT 96 HOURS AFTER FERTILIZATION (DAY 4) STRONGLY CORRELATES WITH CHROMOSOMAL ANEUPLOIDY**

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**Introduction:** Good morphology does not predict aneuploidy. The aim of this study was to analyze embryo morphology on day 4 in relation to the corresponding chromosomal status by analyzing a large preimplantational genetic diagnosis (PGD) database.

**Material and Methods:** Retrospective study (1,352 embryos) **Indications:** recurrent miscarriage, advanced maternal age, implantation failure, severe male factor and mixed causes. Embryo biopsy was performed on day-3. Embryos were co-cultured individually on a monolayer of human endometrial epithelial cells. Fluorescence in-situ hybridization (FISH) was performed for chromosomes 13, 15, 16, 18, 21, 22, X and Y. We analyzed three groups of embryos according to their morphology on day-4: cells (A), morula (B) and blastocyst (C). We calculated by logistic regression analysis the effect of the embryo morphology on aneuploidy by using blocked stage as reference. With the introduction of the embryo categories in the model, we got a prediction of aneuploidy that was compared with the real result of FISH and then evaluated with a ROC curve analysis. The significance of the model was calculated by the omnibus test (like hood ratio).

**Results:** Odds ratio of the effect of each embryo category compared with blocked stage on aneuploidy are expressed together with 95% confidence interval (CI95). The odds ratios were A=2.857 (CI95 1.943-4.202), B=4.207 (CI95 2.876-6.155), C=8.665 (CI95 5.006-14.997),  $p < 0.0001$ . The area under the ROC curve was 0.561 (CI95 0.548-0.575).

**Conclusions:** Correlation between embryo morphology and development on day 4 and chromosomal status makes the incidence of abnormalities higher in embryos with poor development. Despite of these results, morphology is not enough to avoid aneuploidy embryos for transfer but they can be useful to improve the outcome of the in vitro fertilization cycles.