

Introduction

Early cleavage can be used as an embryo selection factor [1][2][3]. It is a morphokinetic marker directly linked to embryo morphology, implantation potential and pregnancy rate [1][2]. The evolution of assisted reproduction has permitted the establishment of new non-invasive embryo selection methods such as time-lapse analysis systems (EmbryoScope®) improving reproductive rates [4][5][6][7][8]. The markers that this technology has helped to define have displaced the first mitotic division as a non-invasive indicator of good embryo quality to using other indicators such as t3 and t5.

Our study's purpose is to establish a relationship between the moment of early cleavage and morphological embryo quality on days 2, 3 and 5.

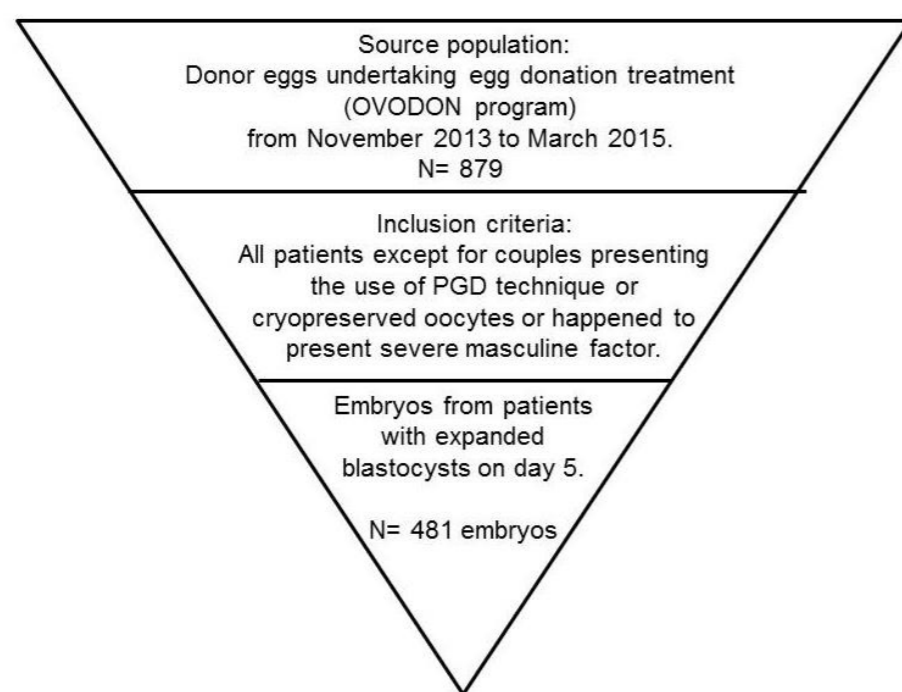


Figure 1: Inclusion criteria.

Materials and methods

Between November 2013 and March 2015, 481 embryos have been retrospectively observed using a time-lapse system: EmbryoScope®. Embryos were classified according to the moment of the first cellular division and their morphological quality on days 2, 3 and 5. The moment of early cleavage of these embryos was analyzed in relation to their morphological quality. The ASEBIR classification has been used for day 2 and 3 embryos. On day 5, the classification utilized has been Gardner's.

The time of early cleavage has been analyzed based on sensitivity, specificity, predictive value, probability coefficient and efficiency.

Results

Embryos dividing between 23 to 26 hours present good morphological quality on days 2 and 3. In the analysis of blastocysts, better morphological quality is found in those embryos with early division between 24 to 25 hours. In studying the relation between embryo development on days 2, 3 and achieving blastocyst stage, our data show better embryo quality in those whose first division took place between 24 to 25 hours. Additionally, we observed that those embryos with inferior quality on day 2 and 3 presented early division before 23 hours, and embryos with inferior quality on day 5 presented early cleavage after 25.5 hours.

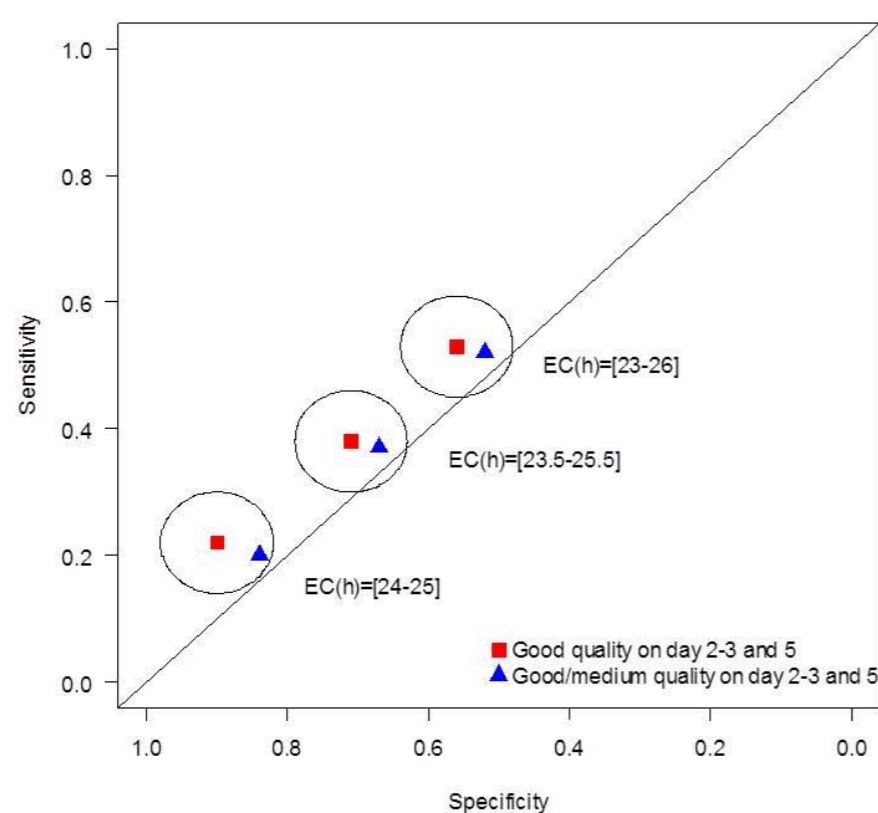


Figure 2: Relation between early cleavage and embryo development on day 2, 3 and blastocyst stage.

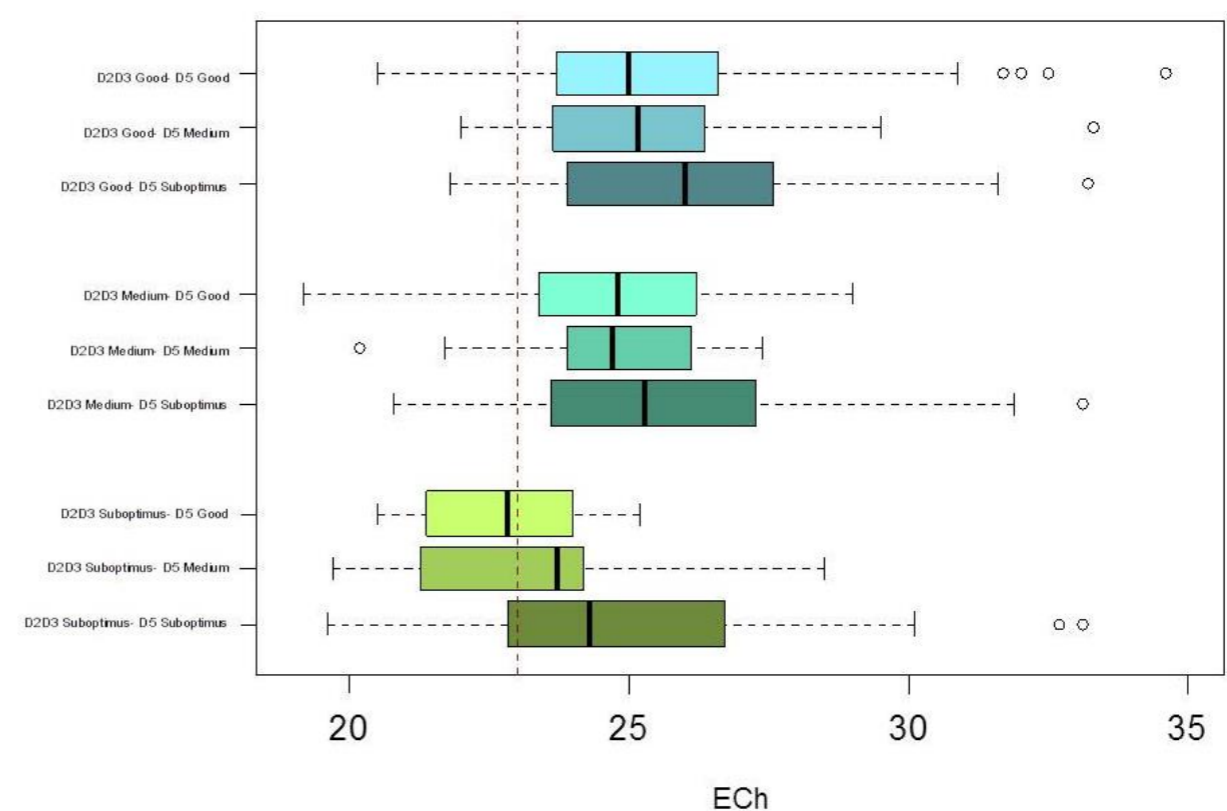


Figure 3: Embryo quality according to early cleavage.

Conclusions

- ✓ There is a relation between early cleavage and initial embryo development on days 2 and 3, and also with morphological quality obtain at blastocyst stage. With all this data recovered, we could use early cleavage as a trustable predictor for embryo development.
- ✓ Early embryo cleavage is a powerful relevant indicator of embryo quality during the first phases of development in a time-lapse system.
- ✓ Embryos with early cleavage between 23-26 hours have a better development than the rest of embryos, considering as good quality embryos those having their first cell division between 23.5-25.5 hours and subsequently if we apply stricter time guidelines.

References

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