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P-176. Impact of inner cell mass position on embryo implantation potential: control strategies

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Study question

Is embryo implantation affected by the position of the inner cell mass (ICM) at the moment of the biopsy?

What do we know?

Preimplantation genetic testing for aneuploidies (PGT-A) helps reduce the risk of implantation failure and miscarriage. Trophectoderm biopsy is performed to analyse the embryo's genetic content prior to transfer. The integrity and health of the ICM during this procedure is crucial for the potential development of the embryo. The position and condition of the ICM can significantly influence implantation and pregnancy rates. Studies suggest that damage or alterations to the ICM during biopsy may negatively impact success rates. Therefore, more studies on the positioning of the ICM during trophectoderm biopsy at blastocyst stage are vital.

Materials and Methods

Retrospective study

n=174 videos of embryos undergoing trophectoderm biopsy for PGT-A were analysed

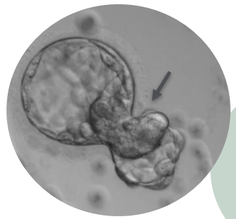
Cultured in global total medium(Life Global) and incubated in time-lapse incubators (Geri,Genea-BIomedix) for 5/6 days.

The AH was performed on day+3 of cleavage using Octax laser. ICM position was noted and the pregnancy rate, clinical pregnancy rate and miscarriage rate was evaluated.

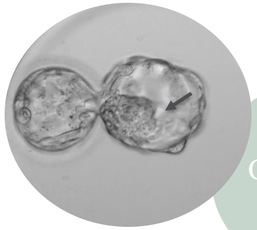
For group comparisons, chi-square test with Yates correction was used. Differences were considered statistically significant when $p<0.05$.

ICM position classification:

n=112
Inside the ZP (In)



n=30
Within the hatched zone (mid)



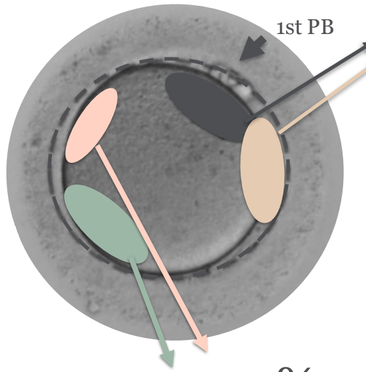
n=33
Outside the ZP (Out)

Main results

Pregnancy rate % p=0.003	Clinical pregnancy rate % p=0.02
63.4%	57.9%
50%	36.7%
30.3%	27.3%

No significant differences were found among the different positions regarding **miscarriage rates** ($p = 0.77$).

ICM position with respect to the position of the 1st polar body (PB, carried out in a previous study on 150 embryos):



* 8.67% could not be determined due to embryo movement during time-lapse video recording.

Figure 1. Percentage of embryos with ICM located in the positions coincident/adjacent or opposite/non-adjacent with respect to the 1st PB.

Conclusions

These findings suggest that:

1. Embryos with an internal ICM position have higher success rates, while an external ICM location is associated to lower rates.
2. The emergence of the ICM at the same or adjacent sites as the AH hole was associated with premature exit of the exterior ICM or its protrusion, both of which adversely affected pregnancy and clinical pregnancy rates.

The number of embryos analysed in this study limits the interpretation and extension of the results obtained. Therefore, an increase in the number of embryos studied may consolidate these preliminary results.