P-115

A deep learning-based system for oocyte image assessment predicts the outcomes of intracytoplasmic sperm injection and morphokinetic fate in human preimplantation embryos

Nanoha Fujiwara, Kenji Ezoe, Tetsuya Miki, Lais Vanzella, Natalie Mercuri, Jullin Fjeldstad, Parisa Mojiri, Dan Nayot, Keiichi Kato
Kato Ladies Clinic & Future Fertility
Contact: n-fujiwara@towako-kato.com

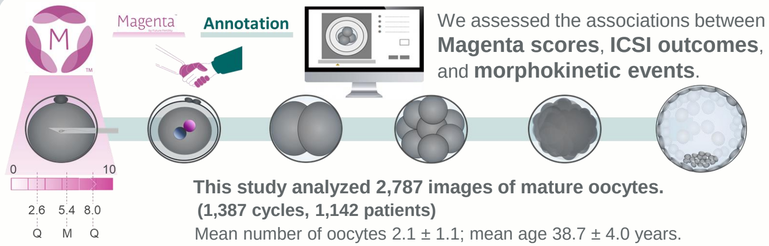
Kato Ladies Clinic

FutureFertility

BACKGROUND

Magenta is a deep learning-based tool that predicts the embryonic development of mature oocytes to the blastocyst stage. It provides individual oocyte scores where higher scores indicate greater likelihood of blastocyst development. However, the specific relationship between Magenta score and morphokinetic parameters is unclear.

MATERIALS & METHODS

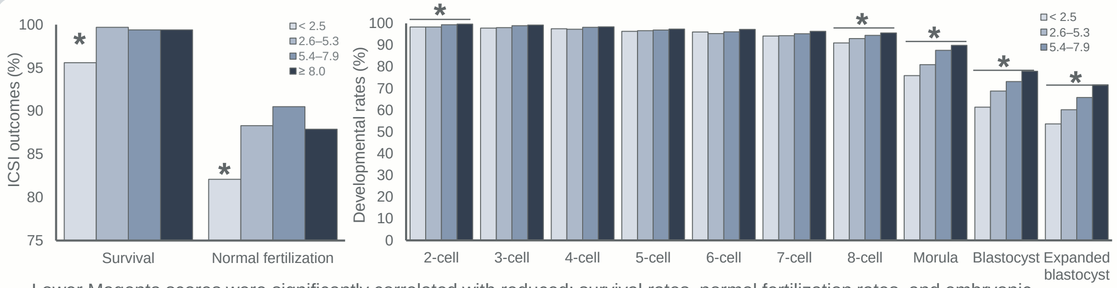


We assessed the associations between **Magenta scores**, **ICSI outcomes**, and **morphokinetic events**.

This study analyzed 2,787 images of mature oocytes.
(1,387 cycles, 1,142 patients)
Mean number of oocytes 2.1 ± 1.1; mean age 38.7 ± 4.0 years.

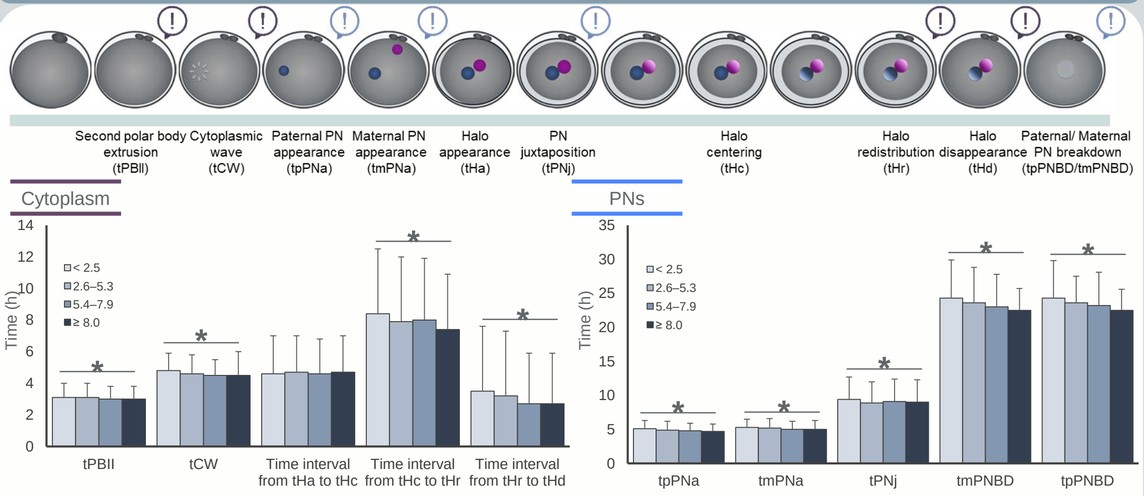
The study cohort was stratified based on the quartile values of the Magenta scores.
Mean±SD [5.3 ± 2.9], Median [5.4], Quartiles [2.6, 8.0]

RESULTS 1. ICSI OUTCOMES & DEVELOPMENTAL RATES



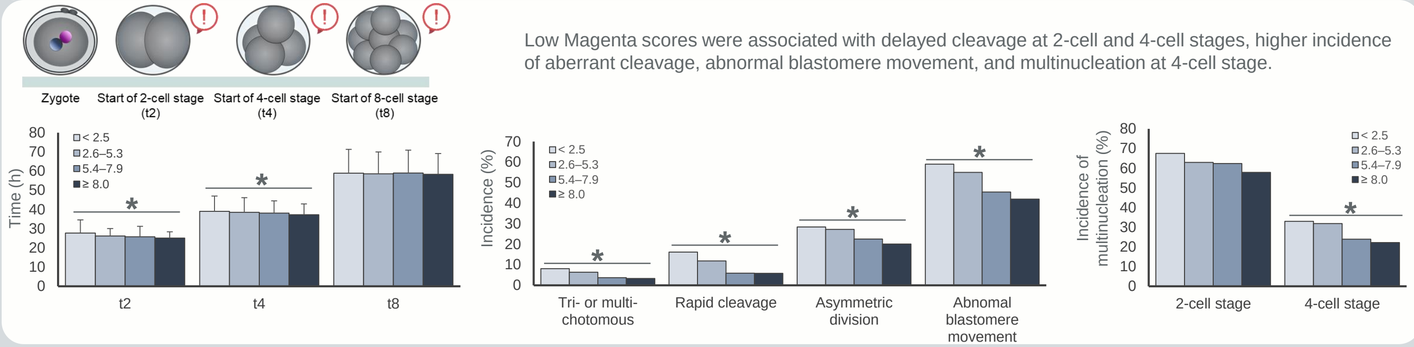
Lower Magenta scores were significantly correlated with reduced: survival rates, normal fertilization rates, and embryonic outcomes, especially during compaction and blastulation.

RESULTS 2. MORPHOKINETICS DURING FERTILIZATION



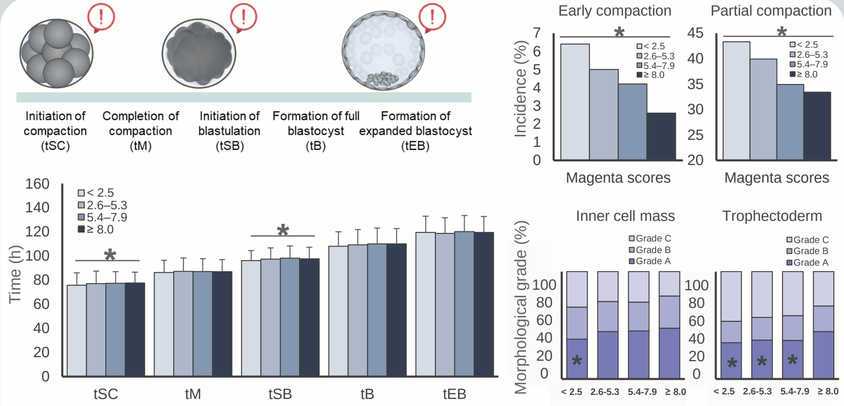
Low Magenta scores were associated with delayed PBII extrusion, CW, PN appearance, juxtaposition, and breakdown, as well as a prolonged cytoplasmic halo.

RESULTS 3. MORPHOKINETICS DURING CLEAVAGE STAGE



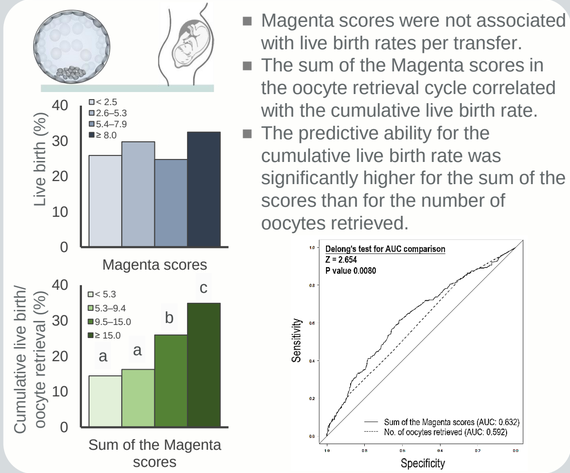
Low Magenta scores were associated with delayed cleavage at 2-cell and 4-cell stages, higher incidence of aberrant cleavage, abnormal blastomere movement, and multinucleation at 4-cell stage.

RESULTS 4. MORPHOKINETICS DURING COMPACTION & BLASTULATION



Low Magenta scores were associated with the accelerated compaction and blastulation, higher incidence of early compaction, partial compaction, and poor morphology of ICM and TE.

RESULTS 5. PREGNANCY OUTCOMES



- Magenta scores were not associated with live birth rates per transfer.
- The sum of the Magenta scores in the oocyte retrieval cycle correlated with the cumulative live birth rate.
- The predictive ability for the cumulative live birth rate was significantly higher for the sum of the scores than for the number of oocytes retrieved.

CONCLUSION

The Magenta score may reflect the integrity of the cell membrane and cytoplasm, as well as the **organization of the cytoskeleton** during fertilization and the early cleavage stages, which contribute to later development, including **cell polarization** during compaction, followed by blastulation and expansion.