

# Sperm selection using microfluidic sorting chips in patients with high DNA fragmentation improves clinical outcomes in Egg-Donor Cycles

Farreras, A., Munuera, A., Freijomil, B., Novo, S., García-Faura, A., Marquès, B., García, F., Castelló, C., López-Teijón, M. Institut Marquès, Barcelona, Spain.

## What is known already

High levels of DNA fragmentation have been associated with embryo development arrest, as well as low implantation and pregnancy rates. Conventional methods used to select sperm for ICSI, as swim-up or density gradients, require centrifugation which increases Reactive Oxygen Species (ROS), one of the main promoter of SDF. Microfluidic systems don't need centrifugation, consequently avoid ROS formation and could allow us to select sperm with better motility, morphology and lower SDF than conventional sperm selection methods.

## Study question

Can sperm selection using microfluidic sorting chips improve reproductive outcomes in patients with high sperm DNA fragmentation (SDF)?

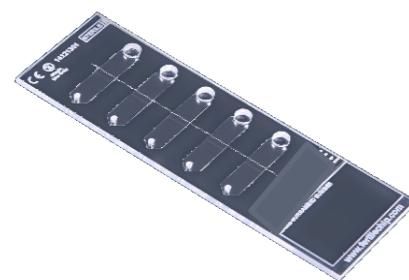
## Study design, size and materials

**Patients with high sperm DNA fragmentation  
(>30%)  
SCD Test**

63 ICSI Egg-Donation Cycles

**Group 1  
N=30**

Microfluidic Chip

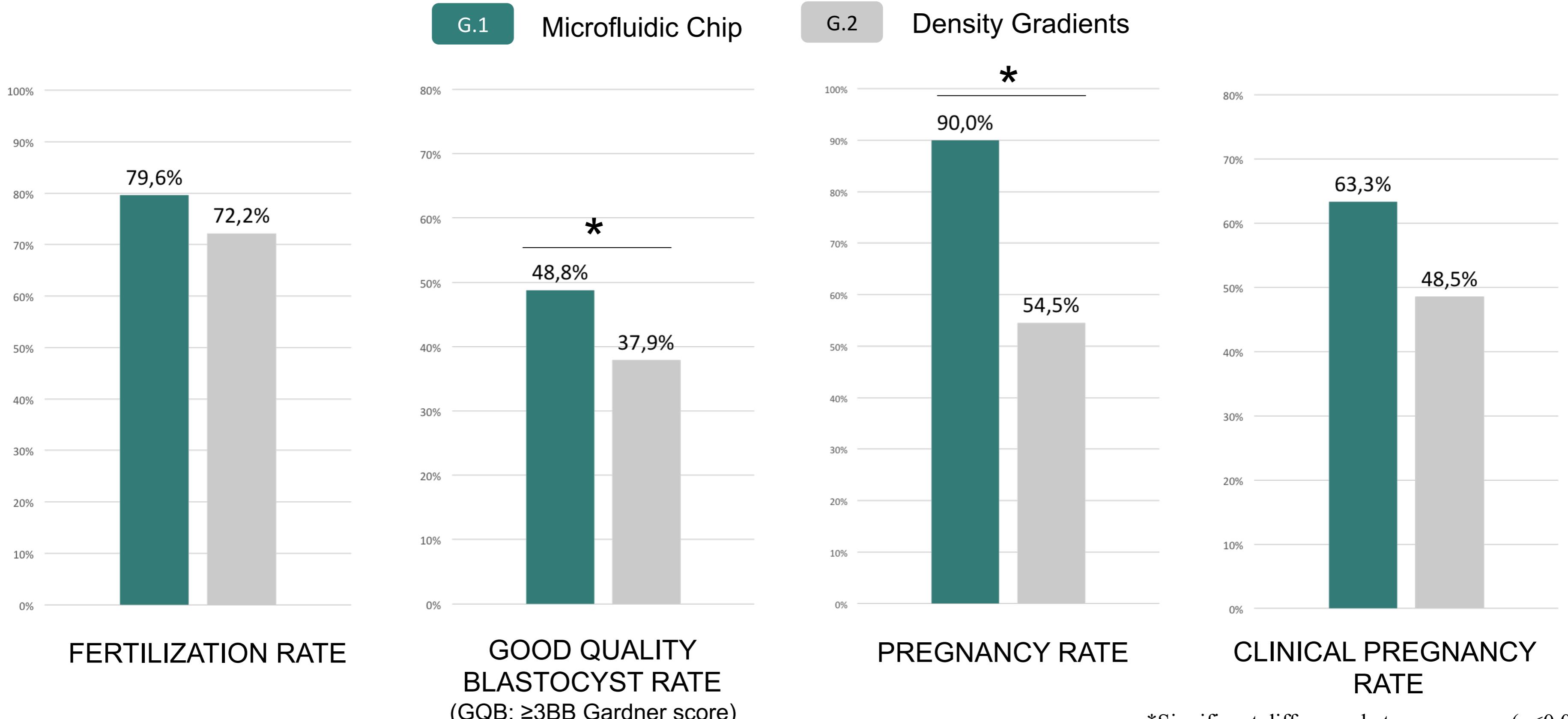


**Group 2  
N=33**

Density Gradients

- Single fresh blastocyst transfer
- Homogeneous Groups (donor age, mean nº of MII and embryos transferred).
- No differences between groups in the SCD test (G1: 45.6±14.5%; G2: 39.0±11.7%).

## Main results



## Wider implications of the findings

- Processing sperm samples with a microfluidic sperm sorting device could be a more efficient alternative to density gradients in patients diagnosed with increased SDF. Our findings suggest that the application of microfluidic systems could be improving the sperm selection with conserved DNA integrity.
- Microfluidic devices increase significantly the number of GQB and therefore could potentially improve the cumulative pregnancy rates and the efficiency of the cycle.