### P-532 Embryo quality needs to be considered as a main criterion when selecting mosaic embryos for transfer

**C. Escriba[1], A. Alambiaga[2], M. Benavent[1], C. Miret[1], A. Garcia[1], M. Lozano[1], D. Gonzalez[1], J. Crespo[3], J. Teruel[1]**

*[1]Equipo Medico Crespo, IVF lab, Valencia, Spain ;*
*[2]Equipo Medico Crespo, Genetics, Valencia, Spain ;*
*[3]Equipo Medico Crespo, medical director, Valencia, Spain*

**Study question:** Should we consider embryo quality as one of the most important criteria to follow when transferring a mosaic embryo?

**Summary answer:** Embryo quality is an implantation biomarker both for euploid and mosaic embryos, and also a determinant for selecting the most eligible mosaic for transfer.

**What is known already:** Several studies show the benefit of transferring mosaic embryos when there are no euploid embryos to transfer, and they still result in ongoing pregnancies and what is more important is that they result in healthy babies.

Studies and guidelines suggest prioritizing mosaic embryos based on maternal age, chromosomes impacted, percentage of aneuploidy, number of chromosomes involved, type of mosaic (simple vs complex, segmental vs complete, monosomy vs trisomy) but embryo quality is never part of these criteria.

Studies claim that mosaic implantation rate is lower than euploid embryos, but they never show if both populations are comparable in terms of quality.

**Study design, size, duration:** This is a retrospective observational study performed in a private centre between February 2018 and January 2020. The study includes the data analysis of 96 euploid blastocysts and 14 low risk mosaic blastocysts (defining low risk regarding chromosome syndromes and less than 50% level mosaicism). All transferred in single embryo transfer (SET) to 105 patients after PGT-A (mean maternal age 38,9 years).

The SET factor enables us to track the implantation outcome of all embryos.

**Participants/materials, setting, methods:** PGT-A with NGS technology was offered to patients of advanced maternal age and/or with repeated IVF failures. Trophectoderm biopsies were performed on day 5 and/or day 6 embryos, with laser assistance. Blastocyst morphology was scored in 3 groups: A: excellent (AA, AB, BA), B: good (BB), C: average and poor-quality embryos (BC, CB, CC). (Gardner-Schoolcraft classification)

Low risk mosaic embryo transfer was offered to patients with no euploid embryos to transfer.

**Main results and the role of chance:** We found no significant differences between both populations (euploid and mosaic embryos) in terms of embryo quality (Chi^2 p-value =0,0975) so we were able to compare the overall implantation of similar quality populations.

Despite euploid implantation being higher as described in most studies, no statistical differences (Chi^2 p-value = 0,4344) were found in terms of implantation rates between mosaic (57,0%) and euploid (67,6%) blastocysts during the same period. There are no differences between the mean age of both groups (39,7 vs 38,8 years, respectively).

The implantation rates for euploid blastocysts were 79,5% (n=39), 62,7% (n=51) and 33,3% (n=6) in the A, B and C blastocyst quality groups, respectively, showing significative differences among the three groups.

The implantation rates of low-risk mosaic blastocysts were 100% (n=3), 62,5% (n=8) and 0,0% (n=3) in the A, B and C blastocyst morphology groups, respectively, showing also still significant differences among the three groups despite the small population. (Chi^2 p-values according to implantation: Euploid =0,0434; Mosaic=0,0419)

We have also compared the three quality categories between both populations showing no significative differences (Chi^2 p-values according to quality: A=0,4344; B=0,9894; C=0,2568), concluding that same quality embryos behave the same way despite being euploid or mosaic.

**Limitations, reasons for caution:** The study is limited by its retrospective nature and the low number of mosaic embryos transferred as they are the last option for transfer. Additionally, it is common to transfer more than one mosaic embryo to increase the chances of pregnancy, therefore losing implantation track.

**Wider implications of the findings:** Embryo quality has always been a strong biomarker predictable for implantation and this is also true for mosaic embryos as well. It is a simple concept, but we cannot compare implantation potential of euploid embryos with mosaic embryos without describing both populations in terms of quality.

**Trial registration number:** not applicable