QUEBEC EXPERIENCE REGARDING PREGNANCY OUTCOMES AFTER MOSAIC EMBRYO TRANSFER FOLLOWING PREIMPLANTATION GENETIC TESTING FOR ANEUPLOIDIES (PGT-A)

Preconception, Preimplantation and Prenatal Genetic Diagnosis (CoGEN)

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OBJECTIVES

At the beginning of the implementation of PGT-A as a way to improve ongoing pregnancy rate following embryo transfer compared to standard in-vitro fertilization (IVF) cycle, only euploid blastocyst were considered for effective implantation, and hundreds of mosaic blastocysts were destroyed after non-recommendation of transfer, with fear of significant risk for poor implantation rate, miscarriage, and abnormal pregnancy outcomes. Recently, several international studies has been published showing growing numbers of successful mosaic blastocyst transfer and healthy ongoing pregnancy, slowly changing the paradigm for transfer guidelines in fertility clinics, and allowing hundreds of patients to use embryos that were previously not even considered for transfer. Our goal is to advocate that transfer of mosaic embryo should always be an option for patient, discussed along appropriate extensive genetic counselling, in order to allow informed decision when no further euploid embryos are available.

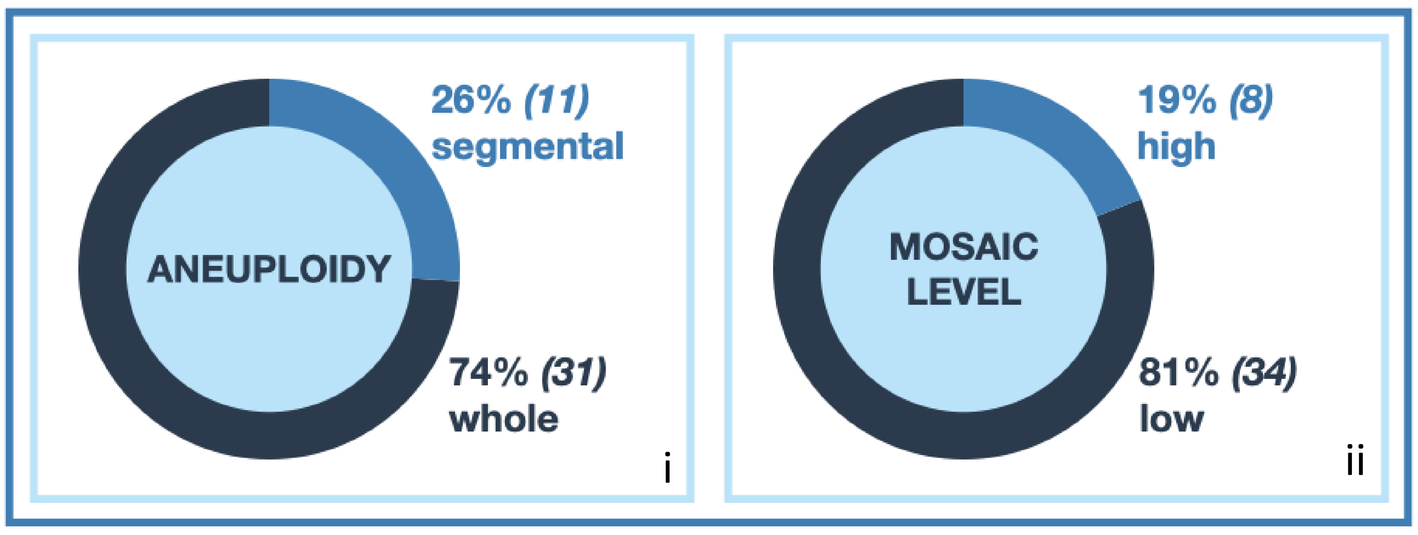
METHODOLOGY

We included 42 patients of ovo clinic that went through IVF cycle and PGT-A analysis between January 2019 and September 2022, and had at least one mosaic transfer. We reported implantation rate, and for those that led to ongoing pregnancy, viability ultrasound, prenatal and neonatal follow-up were also obtained.

RESULTS

This study showed that mosaic embryo transfer was largely accepted by patients when no euploid blastocyst was available. Our cohort showed an implantation rate of 70% (with 30% negative pregnancy test), 52,4% of ongoing pregnancies (4,7% miscarriages, 9,5% blighted ovum). Results of prenatal as well as neonatal evaluation is already showing 19% of confirmed healthy live births but, further data are pending and will soon be obtained from participants.

A



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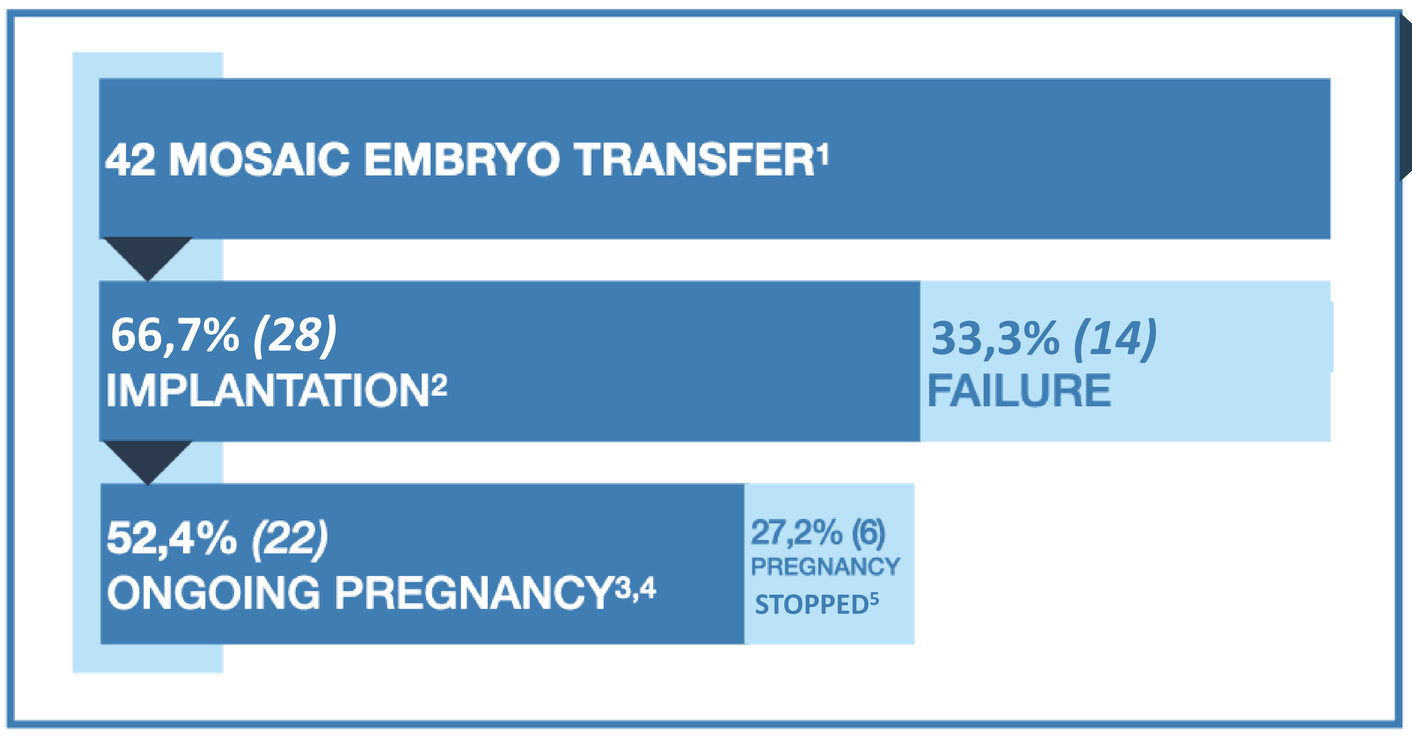

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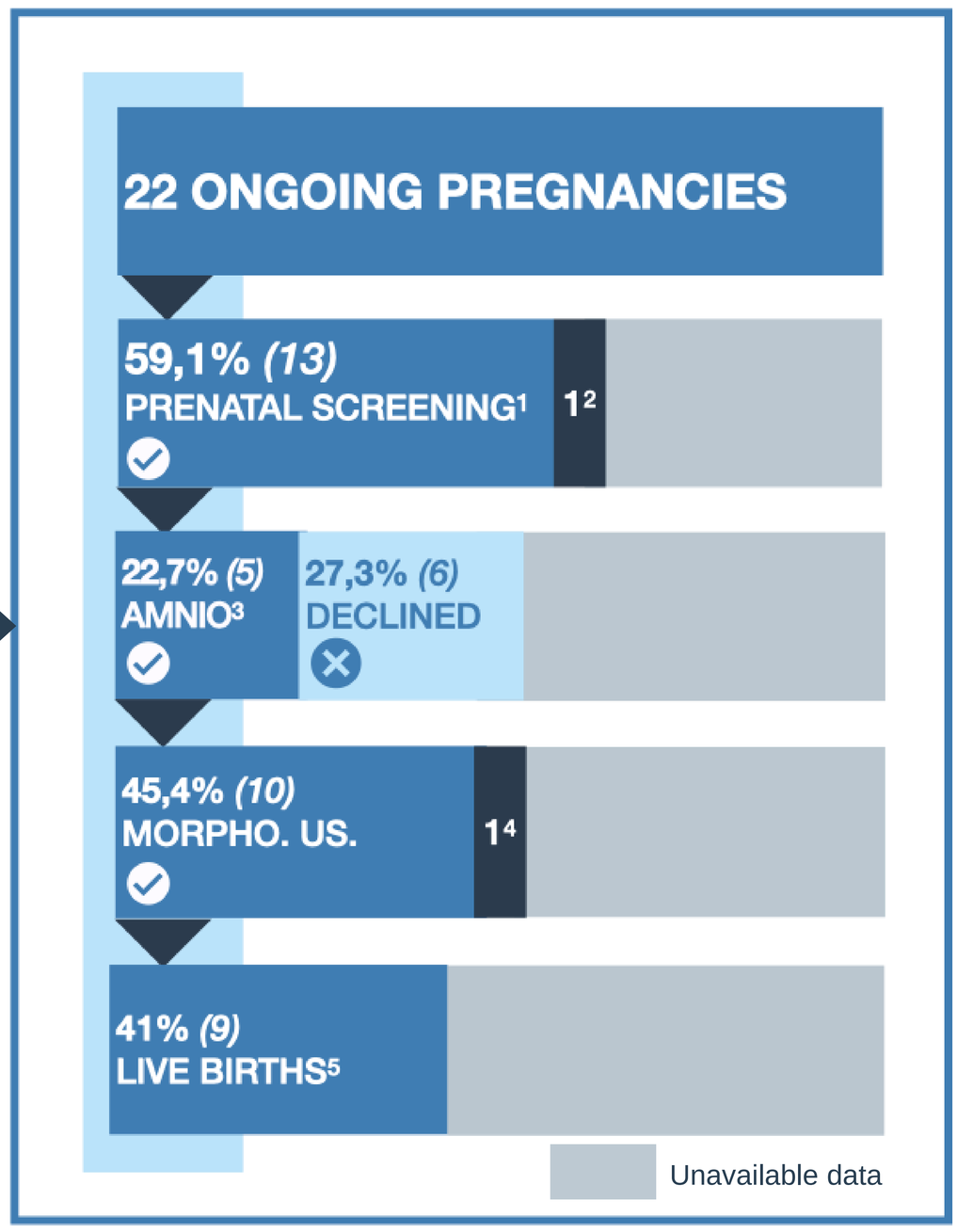

Figure A. Description of the mosaicism identified within the biopsy after PGT-A i. Proportion of segmental versus whole chromosome aneuploidy, ii. Proportion of high versus low level mosaicism

Figure B. Implantation rate and ongoing pregnancy rate following mosaic embryon transfer after PGT-A

1. Only single embryon transfers, in 40 different patients, **2.** Implantation is defined by positive bhCG test, **3.** Ongoing pregnancy is defined by positive fetal cardiac activity on viability ultrasound, **4.** Within the 22 ongoing pregnancies, 1 dichorionic-diamniotic twin pregnancy with vanishing twin identified on viability ultrasound, **5.** Within 6 patients with positive bhCG without ongoing pregnancy : 4 blighted ovums identified on viability ultrasound, 1 negative fetal cardiac activity on viability ultrasound , 1 spontaneous pregnancy rate at 8 weeks after positive cardiac activity

Figure C. Prenatal and neonatal datas from ongoing pregnancies following mosaic embryo transfer after PGT-A

1. Prenatal screening includes nuchal transluency ultrasound and/or non-invasive fetal DNA testing, **2.** High risk of trisomy 18 following non-invasive fetal DNA testing has been identified following transfer of embryo identified as low mosaic for monosomy 18, normal amniocentesis and live birth without particularities, **3.** Analysis following amniocentesis generally includes QF-PCR followed by specific analysis according to the chromosomes involved in the mosaic biopsy +/- uniparental disomy analysis if applicable, **4.** During morphological ultrasound, one echogenic bowel has been identified, patient refused amniocentesis and declined cystic fibrosis analysis, **5.** Within missing datas, 5 pregnancies are still ongoing

CONCLUSION

Mosaic blastocysts are a valuable source of potential healthy ongoing pregnancy and should not be discarded without proper extensive genetic counselling.

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