XX OR XY HAS NO IMPACT ON POST-TRANSFER SUCCESS RATES AS INDICATED BY PREGNANCY RATE OR LOSS FOLLOWING FROZEN EMBRYO TRANSFER OF A SINGLE HIGH QUALITY EUPLOID BLASTOCYST

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ABSTRACT

Background: Several studies have indicated that blastocyst culture and transfer may skew the sex ratio following IVF, yielding more success with XY embryos. This may be due to culture conditions and/or morphological selection criteria that inadvertently favor one sex over another. Alternatively, XX blastocysts could potentially yield lower success rates after transfer due to subtle abnormalities induced by suboptimal culture conditions leading to poor development, failed implantation or early loss. Preimplantation genetic testing for aneuploidy (PGTA) permits identification of blastocyst sex chromosomes prior to transfer. Use of PGTA and subsequent frozen embryo transfer gives ability to control for embryo and endometrial quality to isolate the effect of embryo sex chromosome complement on clinical outcomes.
Objective: To compare clinical outcomes following transfer of a single euploid XX or XY blastocyst in a frozen embryo transfer cycle, controlling for day of blastocyst development and morphological grade to determine if sex chromosome complement impacts outcomes.
Materials & Methods: Data were retrospectively analyzed for frozen embryo transfers using either XX or XY single, high quality euploid blastocysts >3BB on day 5, 6 and 7. To further control for embryo quality, transfers using only day 5 AA quality blastocysts were analyzed. Rates of positive HCG (Pos HCG), clinical pregnancy rate (CPR) and pregnancy loss rates were compared. Differences were determined using Fishers Exact test, $p<0.05$
Results: No statistically significant differences in Pos HCG, CPR or loss rate were apparent following frozen embryo transfer of single euploid XX and XY blastocysts of quality ≥3BB on day 5, 6 and 7. Similarly, no differences were apparent when only day 5 AA quality blastocyst were used.
Conclusions: The XX and XY chromosomal status had no impact on outcomes following transfer of a single high quality euploid blastocyst into a frozen embryo transfer cycle. These data indicate that when a high quality, euploid blastocyst is obtained following IVF, that any skew in the XX/XY ratio of offspring does not appear to be due to embryo driven implantation or post-implantation events. Whether in vitro culture conditions or current embryo grading/selection approaches skew this ratio remains to be proven.

BACKGROUND

- Several studies have indicated that blastocyst culture and transfer may skew the sex ratio following IVF, yielding more success with XY embryos.
- Culture conditions and/or morphological selection criteria may inadvertently favor XY over XX.
- Alternatively, XX blastocysts could potentially yield lower success rates after transfer due to subtle abnormalities induced by suboptimal culture conditions leading to poor development, failed implantation or early loss.
- Preimplantation genetic testing for aneuploidy (PGTA) permits identification of blastocyst sex chromosomes prior to transfer and use of PGTA and subsequent FET gives ability to control for embryo and endometrial quality to isolate the effect of embryo sex chromosome complement on clinical outcomes.

OBJECTIVE

To compare clinical outcomes following transfer of a single euploid XX or XY blastocyst in a frozen embryo transfer cycle, controlling for day of blastocyst development and morphological grade to determine if sex chromosome complement impacts outcomes.

MATERIALS & METHODS

All PGTA FETs utilized a single euploid blastocyst were retrospectively analyzed over a 6 month period

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Cycles we separated by chromosomal status of utilized blastocyst (XX vs XY). All FETs utilized blastocysts of grade 3BB or greater.

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Cycles further analyzed, examining only cycles with top quality Day 5 AA quality blastocyst

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Outcomes compared to determine differences in chemical pregnancy rate, clinical pregnancy rate (CPR), and miscarriage rates between cycles using XX or XY blastocysts

RESULTS

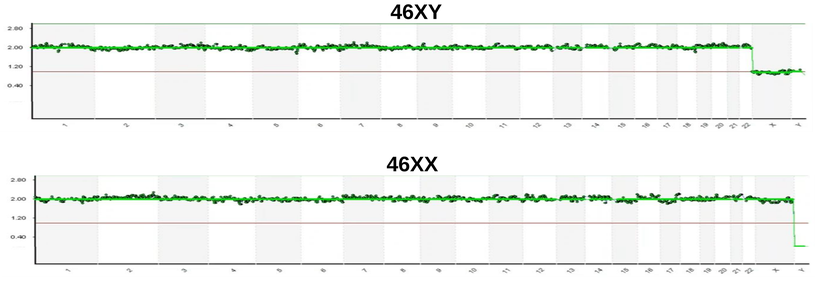

Figure 1. Sample genetics output following PGTA for either A) Xy or B XX blastocysts.

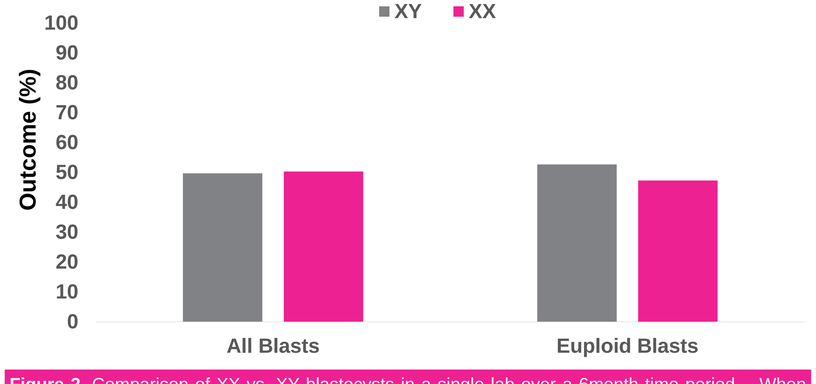

Figure 2. Comparison of XX vs. XY blastocysts in a single lab over a 6month time period. When looking at all blastocyst >=3BB and also only euploid blastocyst. No significant differences exist. (n=1035 and 519 blastocyst, respectively).

RESULTS

Figure 3. No statistically significant differences in Pos HCG, CPR or loss rate were apparent following frozen embryo transfer of single euploid XX and XY blastocysts of quality ≥3BB on day 5, 6 and 7. Similarly, no differences were apparent when only day 5 AA quality blastocyst were used.

	Blast Day/Grade	N	Avg Female Age	Pos HCG	CPR	Loss Rate
XX	D5/6/7 ≥BB	116	35.1	88.8%	80.2%	8.6%
XY	D5/6/7 ≥BB	153	35.4	83.0%	72.5%	10.5%
XX	D5 AA	54	33.9	88.9%	81.5%	7.4%
XY	D5 AA	73	34.9	90.4%	79.5%	10.9%

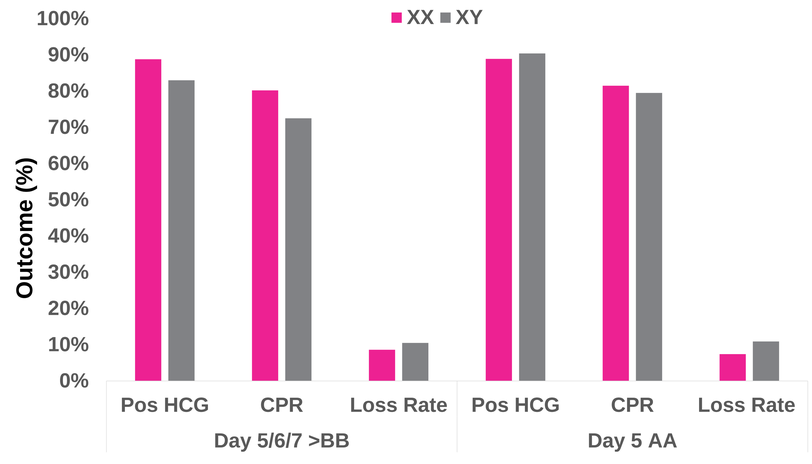

Figure 4. No differences in clinical outcomes were apparent between frozen embryo transfers using either XX or XY blastocyst of similar quality.

CONCLUSIONS

- The XX and XY chromosomal status had no impact on outcomes following transfer of a single high quality euploid blastocyst into a frozen embryo transfer cycle.
- These data indicate that when a high quality, euploid blastocyst is obtained following IVF, that any skew in the XX/XY ratio of offspring does not appear to be due to embryo-driven implantation or post-implantation events.
- Whether specific in vitro culture conditions or current embryo grading/selection approaches skew this blastocyst sex ratio remains to be proven.