OBESITY AS A PERSISTENT RISK BEYOND ANEUPLOIDY

BMI, Live Birth, and Miscarriage Risk in PGT-A–Tested eSET Cycles

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Retrospective Cohort Study — Single Private Fertility Center

BACKGROUND

Maternal obesity is a prevalent, modifiable metabolic factor that may independently impair reproductive success. Whether obesity compromises live birth and implantation rates after controlling for embryo euploidy is an important question for counseling patients undergoing PGT-A–tested embryo transfer.

OBJECTIVE

To evaluate the impact of body mass index (BMI) on live birth rate (LBR) and clinical miscarriage rate (MC) in PGT-A–tested single frozen embryo transfer (eSET) cycles.

Unlike aneuploidy — which PGT-A effectively neutralizes — obesity-related pregnancy loss continues to occur even after chromosomal screening confirms a euploid embryo.

KEY INSIGHT

DESIGN & METHODS

Design: Retrospective cohort study.
A total of 3,435 PGT-A–tested eSET cycles (2023–2024) at a single private fertility center were stratified into six BMI categories. Chi-square, Fisher's exact test, Spearman correlation, and logistic regression were applied (α = 0.05).

BMI CLASSIFICATION (kg/m²)

Underweight	Normal	Overweight	Obesity I	Obesity II	Obesity III
< 18.5	18.5–24.9	25–29.9	30–34.9	35–39.9	≥ 40

Obesity I–III (BMI ≥ 30) comprised the "obese" group referenced throughout the results below.

WHY IT MATTERS

PGT-A confirms chromosomal normalcy, but it cannot correct the metabolic and uterine environment a euploid embryo is transferred into. Quantifying obesity's independent effect highlights an actionable, counseling-ready target alongside genetic screening.

RESULTS

Live birth rate declined significantly once BMI reached the obesity threshold, while clinical miscarriage rose in tandem — despite every transferred embryo being confirmed euploid.

LIVE BIRTH RATE BY BMI GROUP

56–57%	47–49%
BMI < 30 (Non-Obese)	BMI ≥ 30 (Obese)

p < 0.001 across BMI groups

Not-Pregnant Rate: equivalent across all BMI groups (ns)

Suggests obesity impairs pregnancy maintenance rather than implantation.

MULTIVARIATE & CORRELATION FINDINGS

BMI → Live Birth

OR 0.84 per SD

p < 0.001 — independent predictor on multivariate logistic regression

BMI → Miscarriage

r = 0.06

p < 0.001 — positive Spearman correlation

Bottom line: BMI's effect on live birth and miscarriage persists despite confirmed embryo euploidy — pointing to the uterine and metabolic environment as the next frontier for outcome

AS BMI RISES…

Live Birth Rate ↓

56–57%	→	47–49%
Lower BMI		Higher BMI

Miscarriage Rate (Pregnant Cycles) ↑

24%	→	33–35%
Lower BMI		Higher BMI

Among cycles that achieved pregnancy, loss rates were 24% with normal BMI versus 33–35% with obesity — a gap that persists despite confirmed embryo euploidy.

CONCLUSIONS

- BMI ≥ 30 was independently associated with lower LBR and higher pregnancy loss despite confirmed euploid embryo transfer.
- Equivalent not-pregnant rates across BMI groups suggest obesity impairs pregnancy maintenance rather than implantation.
- Unlike aneuploidy, which PGT-A effectively neutralizes, obesity-related pregnancy loss persists after chromosomal screening.
- Pre-conception weight counseling should be a routine part of PGT-A eSET planning to help close this outcomes gap.

LIMITATIONS

Single-center, retrospective design. BMI is a surrogate for adiposity and does not capture body composition or distribution. Underlying mechanisms linking obesity to pregnancy loss were not directly assessed.

FUNDING

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REFERENCES & CONTACT

Full reference list available upon request. Corresponding author: Janelle Jackman, Johns Hopkins University. Presented at the MRSI Annual Meeting, 2026.