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**IS THERE A LINK BETWEEN YOLK SAC DIAMETER AND PREGNANCY LOSS IN SINGLE EUPLOID EMBRYO TRANSFERS?**

Carlos Hernandez-Nieto, MD<sup>1</sup>, Alexis Hatch, MA<sup>1</sup>, Mikayla Meyler, BA<sup>1</sup>, Alison Zerbib, BA<sup>1</sup>, Julia Thaler, BA<sup>1</sup>, Tamar Alkon-Meadows, M.D.<sup>1</sup>, Joseph A. Lee, BA<sup>1</sup>, Martha Luna Rojas, M.D.<sup>2</sup>, Alan B. Copperman, M.D.<sup>3</sup> and Tanmoy Mukherjee, M.D.<sup>1</sup>, (1)Reproductive Medicine Associates of New York, New York, NY, (2)Reproductive Medicine Associates of New York, NY, (3)Icahn School of Medicine at Mount Sinai Hospital, New York, NY

**Title:**

IS THERE A LINK BETWEEN YOLK SAC DIAMETER AND PREGNANCY LOSS IN SINGLE EUPLOID EMBRYO TRANSFERS?

**Submitter's E-mail Address:**

chernandez@rmany.com

**Preferred Presentation Type:**

Oral or Poster

**Study Type:**

Retrospective Cohort Study (includes comparator groups)

**Category - Subcategory(ies):**

Infertility: Diagnosis & Treatment

Infertility: Outcomes

**Funding:**

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Sci Rep. 2020 Jan 31;10(1):1545

JBRA Assist Reprod. 2024 Feb 26;28(1):47-53.

F S Rep. 2024 Dec 4;6(1):52-59.

BMC Pregnancy Childbirth. 2020 Sep 14;20(1):533.

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Nothing to disclose. No off-label or otherwise non-approved product use.

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This abstract has been approved by a local Institutional Review Board (IRB) or equivalent.

**Applying for an award**

Trainee: No

**Abstract Category:**

All Other Categories

**Abstract Text:**

**OBJECTIVE:** The yolk sac (YS) is the first fetal structure visible on transvaginal ultrasound. Variations in its diameter have been associated with aneuploidy and adverse outcomes, such as clinical pregnancy loss (CPL), and are hypothesized to result from abnormal gene expression or lethal abnormalities in the embryo-fetal circulation<sup>1-4</sup>. Current research about YS size primarily includes spontaneous pregnancies dated by patient reported last menstrual period, which can imprecisely estimate gestational age (GA), or ART pregnancies with known GA but involving untested or multiple embryo transfers, limiting clinical. This study aims to assess the relationship between CPL and early YS measurements following single euploid embryo transfers (SEETs) and to establish reference intervals for future use

**MATERIALS AND METHODS:** This retrospective cohort study analyzed patients undergoing IVF/PGT-a between 2016 and 2020. Only SEETs resulting in singleton clinical pregnancies were included. YS size was manually reviewed for accuracy. YS measurements were analyzed by gestational week (5, 6 and 7) based on known GA. Distribution analysis was performed, study cohort groups were categorized based on 5th percentile (p5), the central 90% range (control) or 95th percentile (p95). ANOVA, and a multivariate GEE analysis were performed. ROC curves and Youden indexes were analyzed

**RESULTS:** 2560 cycles were included. Mean oocyte age 35.1±4.4, BMI 23.8±4.3, and AMH 3.6±4.23. CPL rate 13.9%. For the 1106 cases with a GA of 5 weeks, YS measurements were categorized as: p5 ≤ 1.64 mm, control 1.64-4.05 mm, p95 ≥ 4.05 mm. CPL rates differed significantly among groups: 29.8% for p5, 12.1% for control, and 8.9% for p95 (p=0.002). Adjusted analysis showed that compared with the control group, YS in the p5 group were significantly associated with higher odds of CPL (aOR 8.04, 95% CI 1.3-46.3), while p95 was not (aOR 2.0; 95% CI 0.4-10.3). An YS cutoff of 3.08 mm was found to correlate with CPL (SN 74%, SP 39%)

For the 929 cases with a GA of 6 weeks, YS measurements were categorized as: p5 <2.47mm, control 2.47-5.0 mm, and p95 ≥ 5.0 mm. CPL rates differed significantly: 47.9% for p5, 29.9% for control, and 12.5% for p95 (p<0.0001). Adjusted analysis showed that YS in the p5 group were significantly associated with higher CPL (aOR 5.8; 95% CI 2.1-16.3), while p95 was not (aOR 1.001; 95% CI 0.4-2.1). An YS cutoff of 3.43mm correlated with CPL (SN 77%, SP 41%). For the 525 cases with a GA of 7 weeks, YS were categorized as: p5 ≤ 2.91 mm, control 2.91-5.86 mm, and p95 ≥ 5.86 mm. CPL rates significantly differed: 59.3% for p5, 10.2% for control and 25.9% for p95 (p<0.0001). Adjusted analysis showed that YS in the p5 group were significantly associated with higher odds of CPL (aOR 4.7; 95% CI 1.5-14.4), as was the p95 group (aOR 3.5; 95% CI 1.4-8.6). An YS cutoff of 2.12mm correlated with CPL (SN 79%, SP 31%)

**CONCLUSIONS:** At gestational age 5, 6 and 7 weeks, YS diameters below the 5th percentile are significantly associated with clinical pregnancy losses. Also, at 7 weeks' gestation, YS diameters above the 95th percentile are also associated with increased CPL

**IMPACT STATEMENT:** Small YS size in early euploid pregnancies is a strong predictor of increased pregnancy loss

**First Presenting Author**
**Presenting Author**

Carlos Hernandez-Nieto, MD  
 Email: chernandez@rmany.com -- Will not be published

Reproductive Medicine Associates of New York  
 635 Madison Ave 10th Fl  
 New York NY 10022-1009  
 USA

Within the past 2 years, have you or your spouse/partner had any potential COI?

No

Signature: Carlos Hernandez-Nieto



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Second Author

---

Alexis Hatch, MA  
**Email:** alexis.hatch@icahn.mssm.edu -- Will not be published

Reproductive Medicine Associates of New York  
635 Madison Ave 10th Fl  
New York NY 10022-1009  
USA

Within the past 2 years, have you or your spouse/partner had any potential COI?  
No  
Signature: Alexis Hatch

Third Author

---

Mikayla Meyler, BA  
**Email:** mmeyler@rmany.com -- Will not be published

Reproductive Medicine Associates of New York  
635 Madison Ave 10th Fl  
New York NY 10022-1009  
USA

Within the past 2 years, have you or your spouse/partner had any potential COI?  
No  
Signature: Mikayla Meyler

Fourth Author

---

Alison Zerbib, BA  
**Email:** azerbib@rmany.com -- Will not be published

Reproductive Medicine Associates of New York  
635 Madison Ave.  
10th Floor  
New York NY 10022  
USA

Within the past 2 years, have you or your spouse/partner had any potential COI?  
No  
Signature: Alison Zerbib, BA

Fifth Author

---

Julia Thaler, BA  
**Email:** JThaler@rmaofny.com -- Will not be published

Reproductive Medicine Associates of New York  
635 Madison Ave.  
10th Floor  
New York NY 10022  
USA

Within the past 2 years, have you or your spouse/partner had any potential COI?  
No  
Signature: Julia Thaler, BA

Sixth Author

---

Tamar Alkon-Meadows, M.D.  
**Email:** tamar.alkon@rmamexico.com -- Will not be published

Reproductive Medicine Associates of New York  
635 Madison Ave.  
10th Floor  
New York NY 10022  
USA

Within the past 2 years, have you or your spouse/partner had any potential COI?  
No

Signature: Tamar Alkon -M

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Seventh Author

Joseph A. Lee, BA  
**Email:** jlee@many.com -- Will not be published

Reproductive Medicine Associates of New York  
 635 Madison Ave 10th Fl  
 New York NY 10022-1009  
 USA

Biographical Sketch Early success, marked by his first publication in CELL at Harvard Medical School, inspired Joseph to continue his research endeavors in reproductive endocrinology and infertility. Joseph has been with Reproductive Medicine Associates of New York since 2011. Joseph has authored over 400 peer-reviewed abstracts & manuscripts. Passionate about development, he cultivates relationship with investors & entrepreneurs to advance reproductive endocrinology & infertility care.

Within the past 2 years, have you or your spouse/partner had any potential COI?

No

Signature: Joseph Adam Lee



**CV Upload:**

 [Joseph Lee CV.docx](#)

Eighth Author

Martha Luna Rojas, M.D.  
**Email:** martha.luna@rmamexico.com -- Will not be published

Reproductive Medicine Associates of New York  
 635 Madison Ave.  
 10th Floor  
 NY 10022  
 USA

Biographical Sketch Dr. Martha Luna is a board certified reproductive endocrinologist and infertility specialist . She joined RMA of New York in 2005 and is currently Medical Director of RMA International Mexico located in Mexico City. She completed her fellowship in RMA NY/ Mount Sinai School of Medicine and holds a masters degree by EVMS. Dr. Luna is a clinical professor of the Obstetrics and Gynecology residency program at the American British Cowdray (ABC) Hospital in Mexico City and serves as the Co-Chair of the REI Fellowship Program in Hospital Angeles del Pedregal in Mexico City. She is President of the Mexican Society for Reproductive Medicine (AMMR). Belongs to the Global Associate Panel of Fertility and Sterility.

Within the past 2 years, have you or your spouse/partner had any potential COI?

No

Signature: Martha Luna, MD



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Ninth Author

Alan B. Copperman, M.D.  
**Email:** acopperman@rmany.com -- Will not be published

Icahn School of Medicine at Mount Sinai Hospital  
 Department of OB/GYN and Reproductive Medicine  
 1176 Fifth Ave, Klingenstein Pavilion  
 9th Floor  
 New York NY 10029  
 USA

Within the past 2 years, have you or your spouse/partner had any potential COI?

Yes

Organization Name	Relationship Type	Who has this Relationship?
Progyny	Company Officer Relationship Began - Friday, August 25, 2017 Relationship Ended - Thursday, June 1, 2023	Self

Organization Name	Relationship Type	Who has this Relationship?
	Paid Consultant Relationship Began - Relationship Ended - Direct Stockholder Relationship Began - Friday, August 25, 2017 Relationship Ended - Friday, November 1, 2024	

Signature: Alan B Copperman



**CV Upload:**

 [Alan B. Copperman M.D. - CV \(March 2024\).docx](#)

**Tenth Author**

Tanmoy Mukherjee, M.D.  
 Email: tmukherjee@rmany.com -- Will not be published

Reproductive Medicine Associates of New York  
 635 Madison Ave  
 Floor 10  
 New York NY 10022  
 USA

Within the past 2 years, have you or your spouse/partner had any potential COI?

No

Signature: tanmoy mukherjee



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