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Aylin Sert

University of Massachusetts Medical School

Katherine Leung


University of Massachusetts Medical School

Molly E. Waring

University of Massachusetts Medical School

See next page for additional authors

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Presenter Information

Aylin Sert, Katherine Leung, Molly E. Waring, Raziell Rojas-Rodriguez, Silvia Corvera, and Tiffany A. Moore Simas

Keywords

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Comments

Aylin Sert participated in this study as a medical student in the Senior Scholars research program at the University of Massachusetts Medical School.

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Association between First Trimester Pregnancy Associated Plasma Protein–A and the Development of Gestational Diabetes Mellitus

Aylin Sert, MEd¹, Katherine Leung, MPH², Molly E. Waring, PhD^{2,3,4}, Raziel Rojas-Rodriguez^{4,5}, Silvia Corvera, MD^{4,5}, Tiffany A. Moore Simas, MD MPH MEd^{2,4,6}

¹ Clinical Translational Research Pathway, University of Massachusetts Medical School

² Division of Research, Department of Obstetrics & Gynecology, University of Massachusetts Medical School/UMass Memorial Health Care

³ Department of Quantitative Health Sciences, University of Massachusetts Medical School

⁴ Graduate School of Biomedical Sciences, University of Massachusetts

⁵ Program in Molecular Medicine, University of Massachusetts Medical School

⁶ Department of Pediatrics, University of Massachusetts Medical School/UMass Memorial Health Care

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Background: Gestational diabetes (GDM) is a common pregnancy complication with significant cardiometabolic consequences for mothers and offspring. Previous research from our group suggests that adipose tissue IGFBP-5 and its unique metalloprotease PAPP-A (**P**regnancy **A**ssociated **P**lasma **P**rotein-A) may play mechanistic roles in GDM development by regulating functional IGF-1 levels and lipid storage and metabolism.

Aim: To examine the relationship between circulating PAPP-A levels and GDM development. We hypothesized that high first trimester PAPP-A levels would be associated with decreased GDM risk.

Methods: A retrospective cohort of women delivering singleton gestations at UMass Memorial Healthcare (2009, 2010, 2014, 2015) was assembled by abstracting electronic medical records. PAPP-A was measured in first trimester (11-14 weeks), and reported as quartiles of multiples of the mean (MoM) based on gestational age and adjusted for maternal weight and race/ethnicity. GDM diagnosis based on standard 2-step protocol (~24-28 weeks; failed 50g 1hr glucola screen then ≥ 2 abnormal values per Carpenter-Coustan criteria on 100g 3hr glucose tolerance test). Crude and multivariable-adjusted logistic regression models estimated the association between PAPP-A MoM quartiles and GDM.

Results: Women (N=1,251) were 29.7 (SD:5.7) years old and 12.5 (SD:0.6) weeks gestation at PAPP-A measurement. 7.6% (n=95) developed GDM. Median PAPP-A MoM were 0.7 (inter-quartile range [IQR]=0.5-1.0) among women with GDM and 0.9 (IQR=0.6-1.3) among controls; 39% versus 23% were in the 1st quartile, respectively. After adjusting for pre-pregnancy body mass index, nuchal translucency, crown rump length, smoking status, and parity, women with PAPP-A MoM in 2nd, 3rd, and 4th quartiles had 52% (OR=0.48, 95%CI=0.26-0.88), 45% (OR=0.55, 95%CI=0.30-0.99) and 73% (OR=0.27, 95%CI=0.13-0.53) lower odds of GDM compared to women in the 1st quartile.

Conclusion: Higher PAPP-A MoM levels were associated with lower GDM risk. Future studies will assess whether higher PAPP-A levels are associated with enhanced IGF-1 signaling and improved pregnancy metabolic homeostasis.

My contact information is the following:

Aylin Sert, Ed.M.

Cell: 781-367-4756

Editor, [AAP Medical Student News](#)

University of Massachusetts Medical School

MD Candidate ~ Class of 2016

aylin.sert@umassmed.edu