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Placental interleukin-6 is associated with infant negative affect at 6-months

Elizabeth K. Wood, Hanna C. Gustafsson, Jennifer C. Ablow, Joel T. Nigg, Jamie O. Lo, and Elinor L. Sullivan

Department of Psychiatry, Oregon Health & Science University

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Abstract

Background: Negative affect (NA), the propensity to experience negative emotions, emerges during early infancy and is an indicator of vulnerability for developmental psychopathology. Programming of risk for NA has been associated with fetal exposure to maternal peripheral inflammatory factors; however, little is known regarding the biological pathways by which placental inflammation contributes to emerging infant behavioral health.

Methods: We examined the link between placental inflammation and infant NA. We measured protein levels of inflammatory factors in placentas (N = 206) from well-characterized mother-infant dyads. Here we focused on IL-6, a potent pro-inflammatory cytokine that has been previously linked to infant neural developmental outcomes. Infant NA was assessed using the Gentle Arm Restraint (GAR) task, a laboratory measure of infant frustrative anger recorded and coded by trained raters.

Results: Structural equation models adjusted for time spent pushing during labor and gestational age at birth, demonstrated that increased interleukin-6 (IL-6) was associated with elevated infant NA during the GAR task ($\beta = 0.17, p = 0.04$). Results survived multiple sensitivity tests.

Conclusions: Identifying placental inflammatory factors linked with infant neurobehavioral development is critical for understanding early developmental processes. Our finding that placental IL-6 is associated with infant NA suggests that the placenta plays a role in prenatal programming of risk for NA. This information can contribute to future clinical prediction and preventive efforts that seek to optimize infant behavioral outcomes.