Peer Reviewed

Clinical Pearl: The Neurodevelopmental Outcomes of Infants Born During the COVID-19 Pandemic: It is Complicated!

Joseph R. Hageman, MD

I just read a well-written paper by Shuffrey and co-authors from Columbia University in New York City about a comparison of the neurodevelopmental outcomes of infants at age six months who were born at term (completed at least 37 weeks gestation) to 114 mothers exposed and 141 unexposed to SARS-CoV-2 infection exposure during their pregnancy (1). In addition, these two groups' neurodevelopmental outcomes were compared to a group of 67 term infants born at Columbia before the pandemic (1). Interestingly, the two groups of pandemic infants had statistically significantly lower scores on their Ages and Stages Questionnaire (ASQ-3) gross motor, fine motor, and personal social subdomains compared with the pre-pandemic group of infants born also born at Columbia University (1).

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In addition, there was no statistical difference in these subdomains in the pandemic infants, regardless of whether the mothers had SARS-CoV-2 infection or not. The pandemic infants had lower scores than those born before the pandemic, and the authors attribute these lower scores to maternal stress or maternal immune activation during the pandemic (1). Most of these pregnant mothers had asymptomatic or mild infections (110/114 mothers), and 87 of 114 mothers were infected during the second or third trimester (1). The primary analysis revealed no association between maternal SARS-CoV-2 status, timing, or severity and the infants' ASQ-3 scores (1).

The clinically relevant conclusions of this study are (1) the importance of maternal distress during the pandemic, which includes maternal immune activation defined as measured levels of inflammatory markers (e.g., IL-6) that exceed the normal range or in the high normal range and (2) the association of maternal immune activation/stress/distress and its effect on infant development. It is not so much this intrauterine infection of the fetus in this case, but the effect of the maternal distress on the fetal neurologic system (1,2), (3) the importance of long-term neurodevelopmental follow up of these infants (1).

References:

1. *Shuffrey LC, Firestein MR, Kyle MH, et al. Association of birth during the COVID-19 pandemic with neurodevelopmental status at 6 months in infants with and without in utero exposure to maternal SARS-CoV-2 infection. JAMA Pediatr doi:10.100/jamapediatrics.20215563, Published online January 4, 2022.*
2. *Boulanger-Bertolus J, Pancaro C, and Mashour GA. Increased role of maternal immune activation in neurodevelopmental disorders. Frontiers in Behavioral Neuroscience 2018;12 (article 230): 1-6.*

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Joseph R. Hageman, MD
Senior Clinician Educator
Pritzker School of Medicine
University of Chicago
MC6060
5841 S. Maryland Ave.
Chicago, IL 60637
Phone: 773-702-7794
Fax: 773-732-0764
Email: jhageman@peds.bsd.uchicago.edu

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jhageman@peds.bsd.uchicago.edu