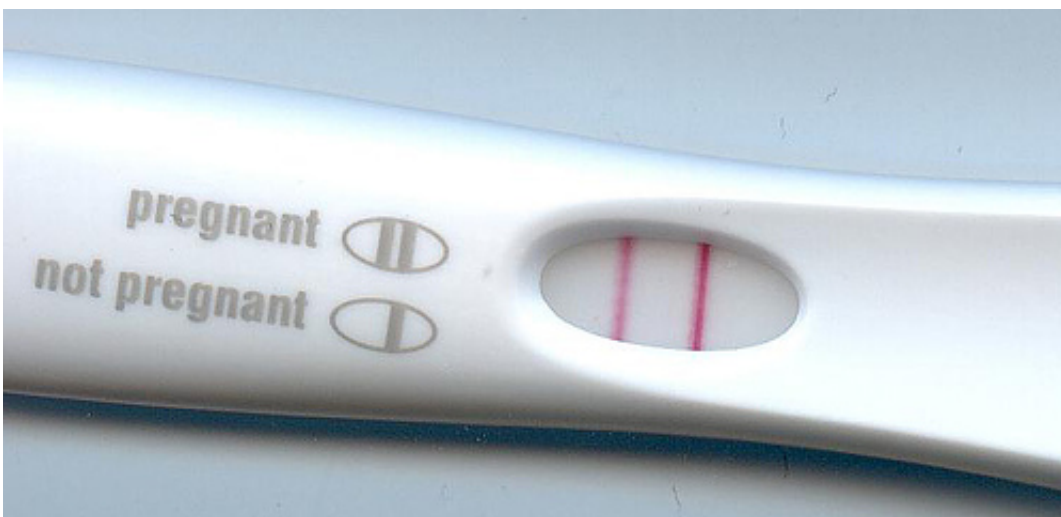


Stress in pregnant disadvantaged women linked to neurodevelopment problems in offspring

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Pregnancy test. Credit: public domain

(Medical Xpress)—A team of researchers affiliated with several institutions in the U.S. has found a link between pregnant disadvantaged women and neurodevelopmental problems in their babies. In their paper published in *Proceedings of the National Academy of Sciences*, the group describes their study of serum levels in 1,494 pregnant women participating in the New England Family Study, and what they found.

Prior research has shown that stress can make the immune system less effective. Other research has shown that children raised in economically

disadvantaged homes tend to have more health problems as they age, possibly due to immunity problems. Now, it appears that many [health problems](#) may get their start while such children are still in the womb. In this new effort, the researchers looked at [serum levels](#) in [pregnant women](#) to learn more about how well their immune system was functioning. To that end they measured cytokines, such as the proinflammatory cytokine IL-8 and the anti-inflammatory cytokine IL-10 and also looked at the ratios between them.

Prior research efforts have shown that stress can cause the body to produce less IL-8—in the case of the pregnant women, lowered levels were associated with [neurological abnormalities](#) for babies four months old and at one year old. This, the researchers suggest, means that economically challenged pregnant women tend to experience more stress than pregnant women that are better off—and this results in the birth of babies with more [neurodevelopmental problems](#). They note that not all cytokines were adversely impacted—TNF- α , IL-6 and IL-1 β showed no associations with neurological abnormalities.

The problem, the researchers suggest, is that poor women are faced with issues such as getting food on the table and often raising children alone—and oftentimes, there are also issues of abuse. Such environments quite naturally lead to more stress, which can lead to immune problems—and to other behaviors linked to stress such as unhealthy practices like smoking, drinking or taking illegal drugs that can make things worse. They note that learning more about the consequences of [stress](#) on pregnant women can offer those who form policy more tools when allocating resources.

More information: Stephen E. Gilman et al. Socioeconomic disadvantage, gestational immune activity, and neurodevelopment in early childhood, *Proceedings of the National Academy of Sciences* (2017). [DOI: 10.1073/pnas.1617698114](https://doi.org/10.1073/pnas.1617698114)

Abstract

Children raised in economically disadvantaged households face increased risks of poor health in adulthood, suggesting that inequalities in health have early origins. From the child's perspective, exposure to economic hardship may begin as early as conception, potentially via maternal neuroendocrine–immune responses to prenatal stressors, which adversely impact neurodevelopment. Here we investigate whether socioeconomic disadvantage is associated with gestational immune activity and whether such activity is associated with abnormalities among offspring during infancy. We analyzed concentrations of five immune markers (IL-1 β , IL-6, IL-8, IL-10, and TNF- α) in maternal serum from 1,494 participants in the New England Family Study in relation to the level of maternal socioeconomic disadvantage and their involvement in offspring neurologic abnormalities at 4 mo and 1 y of age. Median concentrations of IL-8 were lower in the most disadvantaged pregnancies [−1.53 log(pg/mL); 95% CI: −1.81, −1.25]. Offspring of these pregnancies had significantly higher risk of neurologic abnormalities at 4 mo [odds ratio (OR) = 4.61; CI = 2.84, 7.48] and 1 y (OR = 2.05; CI = 1.08, 3.90). This higher risk was accounted for in part by fetal exposure to lower maternal IL-8, which also predicted higher risks of neurologic abnormalities at 4 mo (OR = 7.67; CI = 4.05, 14.49) and 1 y (OR = 2.92; CI = 1.46, 5.87). Findings support the role of maternal immune activity in fetal neurodevelopment, exacerbated in part by socioeconomic disadvantage. This finding reveals a potential pathophysiologic pathway involved in the intergenerational transmission of socioeconomic inequalities in health.

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