HIV-Negative Babies Born to Women With HIV May Have Compromised Health

For the first time, researchers have identified an immune-based difference between such babies based on the HIV status of their mothers.

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For the first time, researchers have identified a difference in the immune systems of HIV-negative infants based on whether they were born to a woman with the virus.

This finding may help explain why, globally, HIV-exposed but uninfected infants tend to have higher rates of developmental delays, sickness and death compared with infants born to HIV-negative women. The study was able to rule out antiretrovirals (ARVs) as the cause of this difference because it relied on blood samples drawn before HIV treatment was introduced in Kenya.

Publishing their findings in Nature Scientific Reports, Barbara Lohman-Payne, PhD, an associate research professor at the University of Rhode Island's Institute for Immunology and Informatics, and her colleagues analyzed what is known as the T-cell receptor beta-chain (TRB) repertoire in infants as seen in cord blood samples. In particular, the researchers looked at the diversity within the repertoire of these immune cells. Greater diversity signifies a healthier immune system that is better able to respond to a wide spectrum of pathogens.

The study authors relied on samples drawn from 19 HIV-exposed but uninfected infants between 1992 and 1997 in Nairobi, Kenya. ARVs were not introduced in that country until the 2000s. For a comparison group, they analyzed samples from nine HIV-negative babies born to women without the virus drawn between 2003 and 2005 in Nairobi. These control infants were matched according to socioeconomic characteristics.

Genetic sequencing for the infants' samples revealed broad diversity in the TRB repertoires of the babies born to HIV-negative mothers and comparatively undiverse repertoires in the infants born to women with HIV.

The study authors concluded that this was the first study to demonstrate differences in TRB diversity between the cord blood samples of HIV-exposed but uninfected infants and HIV-negative,

unexposed infants, writing that their investigation “provides evidence that maternal HIV, in the absence of transmission, influences the adaptive immune system of the unborn child.”

“For this study to succeed required a multiyear, multi-continent collaboration that provided generous access to the samples we needed,” Lohman-Payne said in a press release. “Thanks to that collaboration, importantly, we now have a fuller picture of the potential impact of HIV-exposure on infants regardless of their HIV status.”

To read a press release about the study, click here.

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