

Meconium may provide clues to fetal-alcohol exposure, forecast behavioral issues later in childhood

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Newborn babies with indicators of alcohol in their stool are more likely to face behavioral difficulties later in childhood, according to new study

from a team of multi-disciplinary researchers at Case Western Reserve University.

The research, published recently in the *Journal of Drug and Alcohol Dependence*, suggests that a biomarker at birth can identify [prenatal alcohol exposure](#) (PAE) and subsequent impairments in a child's behavior, including aggressiveness and delinquency.

Lynn Singer, professor at the School of Medicine and the study's lead researcher, said that testing meconium—a newborn's first stool—is important because fetal-alcohol exposure is usually determined through self-reported consumption by mothers—and is often unreliable.

"This research corroborates previous findings about fetal-alcohol effects," Singer said. "In a large longitudinal study, we found behavioral difficulties at school age related to a bio-measure at birth—the value is that you can identify those children most at risk."

The research stemmed from Project Newborn, a 24-year research project funded by the National Institutes of Health's National Institute on Drug Abuse, which has studied nearly 400 children since their births in the mid-1990s. The study followed the physical, social and cognitive development of babies born to mothers who used cocaine, alcohol and other drugs while pregnant.

Singer's co-researchers in the study were: Hasina Momotaz and Cynthia Bearer, also from the School of Medicine; Gregory Powers and Sonia Minnes, the Verna Houck Motto Professor, both from the Jack, Joseph and Morton Mandel School of Applied Social Sciences at Case Western Reserve; and Meeyoung Min from the University of Utah.

The research

For the Case Western Reserve-led study, researchers analyzed the meconium of 216 newborns for levels of fatty acid ethyl esters (FAEE), which serve as biomarkers of fetal-alcohol exposure.

They found that higher concentrations of FAEE were linked to more aggressive and delinquent behaviors at ages 10 and 12, as reported by their caregivers. Previously, Project Newborn researchers found associations between high levels of FAEE and mental development at two years old, and intelligence and reasoning at ages nine and 11.

"We've found that these children have difficulties regulating their behavior," Singer said. "Aggression has been identified, for many years, as a hallmark behavioral aspect of fetal-alcohol exposure. But this study has really cemented prior research by connecting the behavior to physical findings at birth."

Researchers also identified significantly higher rates of substance abuse among adolescents in the cohort and difficulties in development and cognitive skills.

Singer said the research can help identify children who may benefit from intervention for behavioral issues—before they become a problem.

"Detecting prenatal exposure to alcohol at birth," she said, "could lead to early interventions that help reduce negative effects later."

More information: Lynn T. Singer et al. Association of fatty acid ethyl esters in meconium with behavior during childhood, *Drug and Alcohol Dependence* (2020). [DOI: 10.1016/j.drugalcdep.2020.108437](https://doi.org/10.1016/j.drugalcdep.2020.108437)

Provided by Case Western Reserve University

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