

Low-level prenatal alcohol exposure was associated with adverse behavioral outcomes in children at 6 to 7 years of age

Sood B, Delaney-Black V, Covington C, et al. Prenatal alcohol exposure and childhood behavior at age 6 to 7 years: I. Dose-response effect. *Pediatrics*. 2001 Aug;108:e34.

QUESTION

What are the effects of low levels of prenatal alcohol exposure on child behavior at 6 to 7 years of age?

DESIGN

Cohort study with 6 to 7 years of follow-up.

SETTING

An urban, university-based, maternity clinic in Detroit, Michigan, USA.

PARTICIPANTS

501 African-American parent-child (52% boys) pairs. All women who reported alcohol consumption at conception of ≥ 0.5 ounces of absolute alcohol per day and a 5% sample of lower-level drinkers and abstainers were invited to participate (> 2400 women were screened). Exclusion criteria were women positive for HIV and without prenatal care and children who missed multiple test appointments, had major congenital malformation other than the fetal alcohol syndrome, had an intelligence quotient > 2 standard deviations from the sample mean, or had incomplete data.

ASSESSMENT OF RISK FACTORS

Mothers were screened at their first prenatal visit for alcohol and drug use. Maternal alcohol, cigarette, and illicit drug use were prospectively assessed during pregnancy and after giving birth. Prenatal alcohol exposure was computed as the mean absolute alcohol intake (oz) per day throughout pregnancy and was categorized into no use, low use (> 0 but < 0.3 fluid oz of absolute alcohol/d), and moderate-to-heavy use (≥ 0.3 fluid oz of absolute alcohol/d).

MAIN OUTCOME MEASURES

Child behavior assessed blindly by using the Achenbach Child Behavior Checklist (CBCL).

MAIN RESULTS

117 women (23%) reported no alcohol use during pregnancy, 323 (64%) reported low levels of alcohol use, and 66 (13%) reported moderate-to-heavy use. Children with any prenatal alcohol exposure were more likely to have higher CBCL scores on externalizing (aggression and delinquent) and internalizing (anxious or depressed and withdrawn) syn-

drome scales and on the total problem score. The odds ratios (ORs) for the exposed groups of scoring in the clinical range of delinquent behavior were 3.2 (95% CI 1.3 to 7.6); for externalizing, 1.7 (CI 1.0 to 3.2); for internalizing, 1.6 (CI 0.9 to 3.1); and for total problem behavior, 1.8 (CI 1.0 to 3.0). Analyzing the data by the 3 prenatal alcohol-exposure groups showed between-group differences for externalizing and total problem behaviors. These differences were statistically significant for the no-exposure and low-exposure groups and the no-exposure and moderate-to-heavy exposure groups for externalizing. For delinquent and total problem behaviors, the difference was statistically significant between only the no-exposure and the moderate-to-heavy exposure groups.

CONCLUSION

Prenatal alcohol exposure, even at low levels, was associated with adverse behavioral outcomes in children 6 to 7 years of age.

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COMMENTARY

The article by Sood and colleagues adds to the growing body of evidence that even low levels of prenatal alcohol exposure have long-term effects on children. This study evaluated the effects of alcohol on child behavior at 6 to 7 years of age. It uses a cohort design, which is appropriate when studying a substance, such as alcohol, that has harmful effects. The mothers in the study were identified at their first prenatal visit, but the timing of this visit during the pregnancy is not specified. If this initial visit was late in the pregnancy, some difficulties might have occurred with accurate recall of the amount of alcohol intake in early pregnancy. This would mean that a precise dose-response gradient could not be ascertained. Because alcohol exposure was averaged for the duration of the pregnancy, the possible effects of the pattern of alcohol consumption cannot be assessed. The results show that exposure to any level of alcohol increased the likelihood of higher scores for externalizing and internalizing behaviors and for the total

problem behavior scores. When the data were studied by level of alcohol exposure, the results were not always statistically significant, but the differences between the groups were at a level that is clinically important.

In this study, increasing levels of alcohol exposure were associated with increasing exposure to other confounding risk factors, but these factors were appropriately controlled for in the analysis and the effect of the increasing levels of alcohol exposure remained. The results of the study confirm the adverse effects of alcohol, even at low levels of exposure, on children and allow practitioners to continue to counsel women that no level of alcohol consumption is safe during pregnancy.

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