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The impact of maternal smoking on fast auditory brainstem responses and early language development

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Exposure to tobacco toxins due to maternal smoking in pregnancy and postnatally may be associated with deficits in auditory processing. Such deficits have been posited to be major neurodevelopmental consequence of maternal smoking and may lead to later language and reading deficits, which are more common in this group. This study explored the mechanisms by which auditory processing may be affected by such exposure. Participants were recruited from two large hospitals in the Atlanta metropolitan area using maternal report of cigarette use and blood and urine samples to assess exposure level. All enrolled infants had to pass the newborn hearing exam and had no known health problems. At 6-months, fast auditory brainstem responses (ABR) were used to assess differences in the sensation of auditory stimuli and related to language development and exposure level. After controlling for age (n=146), maternal smoking during pregnancy was negatively related to latency of ABR and language development. ABR responses accounted for unique variance in language scores after controlling for maternal smoking but the relationship between maternal smoking and language skills was no longer significant if ABR responses were entered first. These results suggest that the relationship between maternal smoking and early language development may be mediated by ABR responses, which reflect the neural encoding of auditory stimuli and may be linked to the deficits in phonemic perception and language development found in previous studies.