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Article

Prenatal Tobacco Exposure and Cotinine in Newborn Dried Blood Spots

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ABSTRACT

BACKGROUND: Tobacco smoking by pregnant women is a major public health hazard with both short- and long-term effects on offspring. This study describes the presence and level of the nicotine metabolite cotinine in newborn dried blood spots (DBS) and compares it with the reported maternal smoking recorded on state birth registries. We hypothesize that cotinine in DBS may be a useful measure of newborn in utero tobacco exposure.

METHODS: An observational, cross-sectional study of 1414 DBS obtained from California, Michigan, New York, and Washington newborn screening programs was carried out. Cotinine levels in DBS were quantified by liquid chromatography tandem mass spectrometry analysis and compared with maternal smoking as reported in vital statistics data.

RESULTS: Cotinine ≥0.3 ng/g was detected in 35% of newborn DBS, including DBS of 29% of newborns whose mothers reportedly did not smoke cigarettes during pregnancy, some of whom were presumably exposed to environmental tobacco smoke. Twelve percent of the newborn DBS had cotinine levels that were ≥9.0 ng/g (equivalent to 6 ng/mL plasma, a level that indicates active smoking of the mother), although 41% of the mothers of these infants reportedly did not smoke.

CONCLUSIONS: These data confirm that reported smoking during pregnancy is an imperfect measure of prenatal tobacco smoke exposure. Cotinine assessment in newborns may improve surveillance of tobacco use during pregnancy.

Key Words:

cotinine dried blood spot testing newborn

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