Feasibility, Acceptability, and Cost of Alcohol Screening in Dried Blood Spots Collected during Routine Newborn Screening

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Introduction:
The collection of dried blood spot (DBS) cards obtained during newborn screening or routine newborn testing offers numerous advantages compared to liquid blood samples. This pilot study investigated the feasibility, acceptability, and cost of collecting a DBS card for research purposes at the University of New Mexico (UNM) during routine testing on newborns.

Methods:
Nurses collected DBS cards from infants who still bled after the routine heel prick. Between February 12 and March 24, 2011 a total of 250 infants were admitted, 250 (95.8%) cards were collected and 0 (4.2%) infants were missed by the research protocol. From 250 cards collected, 200 (87.4%) had at least one full blood spot. Cards were analyzed at the U.S. Drug Testing Laboratory for a novel ethanol biomarker - phosphatidylethanol (PEth). PEth is a phospholipid in cell membranes, detectable in blood up to 3 weeks after alcohol exposure.

Results:
Among 200 samples, 6.5% had PEth > 20ng/mL – the cutoff concentration, even though we could not determine the validity of this biomarker relative to maternal alcohol use. The use of DBS cards rather than liquid blood decreases the cost per sample for collection and analysis of PEth by $5.28 (sensitivity analysis: $4.56-$23.49).

Conclusions:
Data indicates that collection of DBS cards during routine screening a) can be incorporated into newborn admission orders; b) is feasible for the majority of newborns and accepted by families; c) can be used to assess prenatal exposures, though biomarker validity needs to be established; d) is cost-efficient compared to liquid blood.