Ethyl Glucuronide, Umbilical Cord Tissue, Qualitative

Last Literature Review: June 2019 Last Update: August 2023

Ethyl glucuronide testing can be used to detect prenatal exposure to alcohol for infants born to mothers with risk factors (eg, history of alcohol/drug use, mental health issues, and injuries), little or no prenatal care, or previous children with fetal alcohol spectrum disorder (FASD).[1,2,3] Evaluation for prenatal alcohol exposure is indicated if an infant presents with characteristic facial anomalies, prenatal growth deficiency, and/or abnormal neurophysiology.[4] Testing for ethyl glucuronide in umbilical cord tissue may be used as an alternative to urine ethyl glucuronide screening for a newborn.

Featured ARUP Testing

Ethyl Glucuronide, Umbilical Cord Tissue, Qualitative 3000443

Method: Qualitative Liquid Chromatography-Tandem Mass Spectrometry

- Use to detect and document fetal exposure to alcohol during approximately the last trimester of a full-term pregnancy
- Detects ethyl glucuronide, a metabolite of alcohol/ethanol
- Confirmation testing is usually not required due to the analytical specificity of mass spectrometry.

Disease Overview

Screening/Detection

Identification of in utero alcohol exposure may aid in early diagnosis of adverse outcomes known as fetal alcohol spectrum disorders (FASD), and can help facilitate timely follow-up and effective management of long-term social and medical needs for the exposed newborns.[5]

Acute ethanol exposure is not predicted by testing umbilical cord tissue but detects ethyl glucuronide, which[1]:

- Has a longer window of detection than ethanol
- Is a good biomarker of alcohol use in pregnancy

Umbilical cord tissue testing may be preferable to meconium due to[6]:

- Ease of collection of a larger specimen
- Reduced turnaround time (if specimen is sent to the laboratory on the day of birth)

Test Interpretation

Analytic Sensitivity/Specificity

- Sensitivity: consistent with detection of ethanol metabolite(s) observed in meconium testing[6]
- Specificity: high; mass spectrometric method reduces false positives and the need for confirmatory testing

Results

Results	Result Description	Interpretive Data
Present	Ethanol metabolite detected in umbilical cord tissue	Does not insinuate impairment and may not affect outcomes for the infant
Not detected	Ethanol metabolite absent in umbilical cord tissue	Does not exclude the possibility that the mother used alcohol during pregnancy

Limitations

- Detection of ethyl glucuronide in umbilical cord tissue is intended to reflect maternal alcohol use during pregnancy
  - Pattern and frequency of alcohol used by the mother cannot be determined by this test
  - False positive results may be caused by postcollection production/synthesis of ethyl glucuronide
- A negative result does not exclude the possibility the mother used alcohol during pregnancy

- Detection of ethyl glucuronide in umbilical cord tissue depends on extent of maternal alcohol use, as well as ethyl glucuronide stability during sample storage and/or transport, variability in ethyl glucuronide formation, and placental transfer of ethanol and metabolites, and analytical performance
- Incidental exposure from ethanol-containing products (ie, hand sanitizers and wipes, mouthwash) may be detected when used directly on the specimen or used nearby during sample collection

References

1. Joya X, Friguls B, Ortigosa S, et al. Determination of maternal-fetal biomarkers of prenatal exposure to ethanol: a review. *J Pharm Biomed Anal*. 2012;69:209-222.
2. Kvigne VL, Leonardson GR, Borzelleca J, et al. Characteristics of mothers who have children with fetal alcohol syndrome or some characteristics of fetal alcohol syndrome. *J Am Board Fam Pract*. 2003;16(4):296-303.
3. Wabuyele SL, McMillin GA. Quantitation of ethyl-β-D-glucuronide in human umbilical cord tissue by liquid chromatography tandem mass spectrometry (LC-MS/MS). *Methods Mol Biol*. 2019;1872:223-236.
4. Hoyme E, Kalberg WO, Elliott AJ, et al. Updated Clinical Guidelines for Diagnosing Fetal Alcohol Spectrum Disorders. *Pediatrics*. 2016;138(2):e20154256.
5. Maxwell S, Thompson S, Zakko F, et al. Screening for prenatal alcohol exposure and corresponding short-term neonatal outcomes. *Reprod Toxicol*. 2019;85:6-11.
6. Montgomery D, Plate C, Alder SC, et al. Testing for fetal exposure to illicit drugs using umbilical cord tissue vs meconium. *J Perinatol*. 2006;26(1):11-14.

Related Information

Alcohol Use Biomarkers
Newborn Drug Screening - Meconium and Umbilical Cord Tissue
Newborn Drug Testing Algorithm

ARUP Laboratories is a nonprofit enterprise of the University of Utah and its Department of Pathology. 500 Chipeta Way, Salt Lake City, UT 84108
(800) 522-2787 | (801) 583-2787 | aruplab.com | arupconsult.com