



Motherisk Update

Screening for fetal alcohol spectrum disorder

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ABSTRACT

QUESTION I have several patients whom I suspect are drinking during pregnancy. How can I find out for sure if they are?

ANSWER You can use one of the validated tools to screen for problem drinking. Motherisk uses the TWEAK test, but others are just as good. Following birth, you can test infants' meconium for metabolites of ethanol to detect whether they were exposed in utero to excessive drinking.

RÉSUMÉ

QUESTION Je soupçonne quelques-unes de mes patientes de boire de l'alcool durant leur grossesse. Comment savoir si c'est vraiment le cas?

RÉPONSE Vous pouvez utiliser l'un des outils de dépistage validés des problèmes d'alcoolisme. Motherisk utilise le test TWEAK, mais d'autres sont tout aussi efficaces. Après la naissance, le méconium du nouveau-né peut être analysé pour détecter des métabolites d'éthanol et savoir ainsi s'il a été exposé à une consommation d'alcool excessive dans l'utérus.

Fear and embarrassment can prevent alcohol-dependent women from sharing their problem drinking with their physicians, so appropriate help cannot be sought. Just as important, many clinicians do not ask their patients about drinking habits or problems as part of routine history taking.

Fetal alcohol spectrum disorder is a new term that encompasses the range of disability caused by gestational exposure to alcohol, from full-blown fetal alcohol syndrome to its partial presentation as alcohol-related neurodevelopmental delay.¹

During the past few decades, several simple questionnaires that identify problem drinkers with high sensitivity and specificity have been validated.² These questionnaires probe very similar characteristics. Two tests, the TWEAK (tolerance, worry, eye-opener, amnesia, cut down) and the T-ACE (tolerance, annoyed, cut down, eye-opener), have been extensively validated for use during pregnancy

(Figures 1 and 2).^{2,3} The T-ACE is similar to the Woman Abuse Screening Tool developed by family physicians. Family physicians should also investigate physical and laboratory characteristics of problem drinking, most notably abnormal liver function test results.

When there is no information on maternal drinking, physicians can test for alcohol metabolites in meconium, the first fecal excretion of newborns. Several recent studies, including our own, have shown high levels of fatty acid ethyl esters (FAEE) in meconium of babies born to mothers who admitted drinking.^{4,5} The FAEE test has been validated and can be used to establish maternal problem drinking. Because meconium begins to form at about 14 weeks' gestation, positive test results indicate maternal drinking during the second and third trimesters of pregnancy, typically after women have become aware of their pregnancies. This in

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Figure 1. The TWEAK test: Scores of 2 or higher are predictive of problem drinking.

TWEAK	QUESTION	POINTS
Tolerance	How many drinks does it take to make you feel the first effect (before pregnancy)? (Three or more = 2 points)	_____
Worry	Have close friends worried or complained about your drinking in the past year? (Yes = 2 points)	_____
Eye-opener	Do you sometimes take a drink in the morning when you first get up? (Yes = 1 point)	_____
Amnesia	Has a friend or family member ever told you about things you said or did while you were drinking that you could not remember? (Yes = 1 point)	_____
Cut down	Do you sometimes feel the need to cut down on your drinking? (Yes = 1 point)	_____

Figure 2. The T-ACE screening test

How many drinks does it take for you to feel high? (T olerance)
Have people A nnoyed you by criticizing your drinking?
Have you ever felt you ought to C ut down on your drinking?
Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover? (E ye-opener)

itself is a strong indication of alcohol dependency; mothers are unable to change their priorities and abstain from drinking. Motherisk currently considers cumulative levels above 2 nmol/g to be a positive meconium FAEE test result. The Motherisk Alcohol Helpline (1-877-327-4636) or drug

laboratory ([416] 813-5925) can help physicians access this new test.

Recent placental perfusion studies by Motherisk have shown that FAEEs found in newborns were formed in the fetus because they do not cross the placental barrier. They represent true fetal exposure to alcohol.⁶

Results of meconium tests offer a unique opportunity to record gestational exposure to ethanol. Missing this opportunity can leave many children impaired by alcohol at risk of being undiagnosed: evidence of maternal drinking is a prerequisite for diagnosis of fetal alcohol spectrum disorder in cases where pathognomonic facial features are not apparent.

References

1. Koren G, Nulman I. *The Motherisk handbook for the diagnosis of fetal alcohol spectrum disorder*. Toronto, Ont: Motherisk Program; 2002.
2. O'Connor MJ, Whaley SE. Alcohol use in pregnant low-income women. *J Stud Alcohol* 2003;64:773-83.
3. Chang G, Goetz MA, Wilkens-Haug L, Berman S. Identifying prenatal alcohol use: screening instruments versus clinical predictors. *Am J Addict* 1999;8:87-93.
4. Koren G, Nulman I, Chudley AE, Looock C. Fetal alcohol spectrum disorder. *CMAJ* 2003;169:1181-5.
5. Chan D, Caprara D, Blanchette P, Klein J, Koren G. Recent developments in meconium and hair testing methods for the confirmation of gestational exposures to alcohol and tobacco smoke. *Clin Biochem* 2004;37:427-38.
6. Chan D, Knie B, Boskovic R, Koren G. Placental handling of fatty acid ethyl esters: perfusion and subcellular studies. *J Pharmacol Exp Ther* 2004;310:75-82.

MOTHERISK

Motherisk questions are prepared by the Motherisk Team at the Hospital for Sick Children in Toronto, Ont. Dr Chan, Mr Gareri, and Ms Klein are members and Dr Koren is Director of the Motherisk Program. Dr Koren, a Senior Scientist at the Canadian Institutes for Health Research, holds the Ivey Chair in Molecular Toxicology at the University of Western Ontario. This work was supported by a grant from the Canadian Institutes for Health Research.

Do you have questions about the safety of drugs, chemicals, radiation, or infections in women who are pregnant or breastfeeding? We invite you to submit them to the Motherisk Program by fax at (416) 813-7562; they will be addressed in future Motherisk Updates.

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