

# Prevalence of Ethanol Use Among Pregnant Women in Southwestern Uganda

**Lacey English, MPH,<sup>1</sup> Godfrey R Mugenyi, MBChB, MMED,<sup>2</sup> Joseph Ngonzi, MBChB, MMED,<sup>2</sup> Gertrude Kiwanuka, PhD,<sup>3</sup> Ira Nightingale, BSc(Pharm),<sup>4</sup> Gideon Koren, MD,<sup>5</sup> Stuart MacLeod, MD, PhD,<sup>6</sup> Brian E. Grunau, MD,<sup>7,8</sup> Matthew O. Wiens, PharmD, PhD<sup>8</sup>**

<sup>1</sup>School of Medicine, University of North Carolina at Chapel Hill, Chapel Hill NC

<sup>2</sup>Department of Obstetrics and Gynecology, Mbarara University of Science and Technology, Mbarara, Uganda

<sup>3</sup>Department of Biochemistry, Mbarara University of Science and Technology, Mbarara, Uganda

<sup>4</sup>Department of Pharmaceutical Sciences, University of Toronto, Toronto ON

<sup>5</sup>Motherisk, Hospital for Sick Children, Toronto ON

<sup>6</sup>Child and Family Research Institute, BC Children's Hospital, Vancouver BC

<sup>7</sup>Department of Emergency Medicine, University of British Columbia, Vancouver BC

<sup>8</sup>School of Population and Public Health, University of British Columbia, Vancouver BC

## INTRODUCTION

The prevalence of ethanol use in many Sub-Saharan African countries is high and reported to be increasing among women. Some areas of Sub-Saharan African, such as regions of South Africa, have high rates of fetal alcohol spectrum disorder (FASD), but few data exist for other countries. The potential social and economic consequences of alcohol-exposed pregnancies are significant. The objective of this study was to determine the prevalence and predictors of ethanol use among women delivering at a regional hospital in Southwestern Uganda.

## METHODS

Between September and November 2013, all consecutive pregnant women presenting to the maternity ward of the study hospital were invited to participate. Following consent, a standardized questionnaire was administered to elicit prenatal history, current alcohol use, and attitudes about alcohol risks during pregnancy. Alcohol use before pregnancy, before pregnancy recognition, and during each trimester was also recorded. Following delivery, meconium

samples from neonates were collected, frozen, and analyzed for concentration of the ethanol metabolite fatty acid ethyl ester (FAEE), a biological marker of maternal alcohol intake during pregnancy. Significant fetal ethanol exposure was classified as a FAEE concentration  $> 2.00 \text{ nmol/g}$  meconium.

Alcohol use as determined by self-report was categorized according to three patterns of use:

1. any alcohol use during pregnancy,
2. alcohol use during all three trimesters, or
3. weekly alcohol use during any trimester or any binge drinking during pregnancy.

The associations between maternal characteristics and alcohol use during pregnancy were assessed using univariate logistic regression. Biologic and self-report indicators of alcohol use were compared.

## RESULTS

Among 606 woman invited to participate, 505 were enrolled. The prevalence of maternal alcohol use during the current pregnancy was 16% (95% CI 12.9% to 19.4%). Alcohol use as defined by continuous use during all three trimesters

**Key Words:** Pregnancy, alcohol, fetal alcohol spectrum disorder, Sub-Saharan Africa

Competing Interests: None declared.

or moderate/heavy consumption during any trimester was less common, reported by 3.2% and 6.3% of mothers, respectively. HIV status, maternal age, paternal age, marital status, and locale were not independently associated with self-reported alcohol use. Mothers reporting pre-pregnancy alcohol use had higher odds of any alcohol use during pregnancy (OR 16.5; 95% CI 9.5 to 28.9), use during all three trimesters (OR 48.8; 95% CI 11.1 to 214.9), and moderate/heavy consumption during any trimester (OR 10.6; 95% CI 4.9 to 22.8). Post-secondary education (compared with no education or primary education) was negatively associated with alcohol use during pregnancy (OR 0.37; 95% CI 0.15 to 0.89). Partner alcohol use and low risk perceptions of alcohol use during pregnancy were significantly associated with use during pregnancy (OR 3.07 and 4.46, respectively).

A small proportion of neonates tested positive for FAEE  $> 2.00 \text{ nmol/g}$  ( $n = 11$ , 2%), although 44 samples were considered borderline with FAEE concentrations between 0.4 and 2.00 nmol/g. Notably, the proportion of mothers testing positive for FAEE, indicating significant fetal alcohol exposure during pregnancy, did not match the proportion who reported moderate/heavy alcohol use during pregnancy. Overall, four of the 11 FAEE positive

subjects reported moderate/heavy alcohol use and only three of the 30 who reported moderate/heavy alcohol use had FAEE levels of  $> 2 \text{ nmol/g}$ .

## **SUMMARY**

Alcohol use is common among pregnant women in Southwestern Uganda. Prior use and the awareness of few alcohol-related harms were the strongest predictors of use during pregnancy. A minority of meconium samples revealed significant fetal alcohol exposure; the threshold used to define a positive FAEE may be too high, or alternatively early use during pregnancy may not be captured by the FAEE test. Education as a protective factor, along with perceived risk as a risk factor, suggests that educational interventions can assist in efforts to decrease alcohol use during pregnancy in Southwestern Uganda.

## **ACKNOWLEDGEMENT**

We would like to thank MicroResearch, an organization dedicated to advancing training and funding opportunities among Ugandan researchers, for their editorial assistance with this work.