
Children's Environmental Health Research Findings
December 2014

Topic: Aflatoxin exposure in Nepal and Bangladesh

Title: Aflatoxin Exposure During the First 1000 Days of Life in Rural South Asia Assessed by Aflatoxin B_1-lysine Albumin Biomarkers

Conclusion: Aflatoxin B_1-lysine adducts in cord blood samples demonstrated that the fetus had the capacity to convert aflatoxin into toxicologically active compounds and the detection in the same 2-year-old children illustrates exposure over the first 1000 days of life.

Authors: Groopman JD, Egner PA, Schulze KJ, Wu LS, Merrill R, Mehra S, Shamim AA, Ali H, Shaikh S, Gernand A, Khatry SK, LeClerq SC, Jr KP, Christian P

Citation: Food Chem Toxicol. 2014 Oct 9.

Abstract:

Aflatoxin B_1 is a potent carcinogen, occurring from mold growth that contaminates staple grains in hot, humid environments. In this investigation, aflatoxin B_1-lysine albumin biomarkers were measured by mass spectrometry in rural South Asian women, during the first and third trimester of pregnancy, and their children at birth and at two years of age. These subjects participated in randomized community trials of antenatal micronutrient supplementation in Sarlahi District, southern Nepal and Gaibandha District in northwestern Bangladesh. Findings from the Nepal samples demonstrated exposure to aflatoxin, with 94% detectable samples ranging from 0.45 to 2939.30 pg aflatoxin B_1-lysine/mg albumin during pregnancy. In the Bangladesh samples the range was 1.56 to 63.22 pg aflatoxin B_1-lysine/mg albumin in the first trimester, 3.37 to 72.8 pg aflatoxin B_1-lysine/mg albumin in the third trimester, 4.62 to 76.69 pg aflatoxin B_1-lysine/mg albumin at birth and 3.88 to 81.44 pg aflatoxin B_1-lysine/mg albumin at age two years. Aflatoxin B_1-lysine adducts in cord blood samples demonstrated that the fetus had the capacity to convert aflatoxin into toxicologically active compounds and the detection in the same 2-year-old children illustrates exposure over the first 1000 days of life.

Keywords: aflatoxin, child