Case-Control Study of an Acute Aflatoxicosis Outbreak, Kenya

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Abstract

Objectives: During January-June 2004, an aflatoxicosis outbreak in eastern Kenya resulted in 317 cases and 125 deaths. We conducted a case-control study to identify risk factors for contamination of implicated maize and, for the first time, quantitated biomarkers associated with acute aflatoxicosis. Design: We administered questionnaires regarding maize storage and consumption and obtained maize and blood samples from participants. Participants: We recruited 40 case-patients with aflatoxicosis and 80 randomly selected controls to participate in this study. Evaluations/measurements: We analyzed maize for total aflatoxins and serum for aflatoxin B1-lysine albumin adducts and hepatitis B surface antigen. We used regression and survival analyses to explore the relationship between aflatoxins, maize consumption, hepatitis B surface antigen, and case status. Results: Homegrown (not commercial) maize kernels from case households had higher concentrations of aflatoxins than did kernels from control households [geometric mean (GM) = 354.53 ppb vs. 44.14 ppb; p = 0.04]. Serum adduct concentrations were associated with time from jaundice to death [adjusted hazard ratio = 1.3; 95% confidence interval (CI), 1.04-1.6]. Case patients had positive hepatitis B titers [odds ratio (OR) = 9.8; 95% CI, 1.5-63.1] more often than controls. Case patients stored wet maize (OR = 3.5; 95% CI, 1.2-10.3) inside their homes (OR = 12.0; 95% CI, 1.5-95.7) rather than in granaries more often than did controls. Conclusion: Aflatoxin concentrations in maize, serum aflatoxin B1-lysine adduct concentrations, and positive hepatitis B surface antigen titers were all associated with case status. Relevance: The novel methods and risk factors described may help health officials prevent future outbreaks of aflatoxicosis.

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