

CLINICAL SPECIFICATIONS

AFLATOXINS

Chemical Found In:

Aflatoxins are organic chemical compounds produced by a polyketide pathway by many strains of the mold, *Aspergillus*. *Aspergillus flavus* is a particular strain common contaminant in agricultural products such as peanuts and corn.

Sources:

<https://www.cancer.gov/about-cancer/causes-prevention/risk/substances/aflatoxins>

Known Cross-Reactions:

Clinical Significance:

The detection of antibodies to Aflatoxins bound to human protein in serum indicates a breakdown in immunological tolerance and induction of chemical intolerance. Aflatoxin or its metabolites can bind to human tissue proteins and form neo-antigens. These new antigens are comprised of the haptenic chemical plus the tissue antigen. The formation of neo-antigens initiates an immune response which may result in antibody production against the chemical and the human tissue. Continued exposure to the chemical and the subsequent production of antibodies against various tissue antigens, may result in autoimmune reactivity. Aflatoxin exposure can occur via airborne spores entering through the lung barrier, ingested food products entering through the intestinal barrier, or contacted spores entering through the skin barrier. One study has shown a correlation between the level of antibodies to aflatoxins and cumulative exposure of aflatoxins over a period of several months.⁶ Thus, the severity of aflatoxin harmfulness can be compounded by factors such as vitamin deficiency, caloric deprivation, alcohol abuse, and infectious disease status.¹ Aflatoxosis can suppress immune function, including lowering secretory IgA (SIgA) levels.⁷ Due to the vital role SIgA plays in host defense, insufficient SIgA levels may cause a heightened vulnerability to microbial diseases, worsen the effects of malnutrition, and interact synergistically with other toxins.^{1,7} Animal studies show that aflatoxin interferes with vitamins A and D, iron, selenium, and zinc nutrition.⁴

Persons with antibodies to Aflatoxin bound to human protein in serum should avoid exposure to the substance.

References:

1. Bennett and Klich Mycotoxins. Clin Microbiol Rev, 2003; 16(3):497-516.
2. Coulombe. Nonhepatic disposition and effects of aflatoxin B1. In DL Eaton and JD Groopman (eds.), The toxicology of aflatoxins: human health, veterinary and agricultural significance. Academic Press. 1993 pp. 89-101.
3. Liu and Wu. Global burden of aflatoxin-induced hepatocellular carcinoma: a risk assessment. Environ Health Perspect, 2010; 118:818-824.
4. Qazi and Fayyaz. Aflatoxin contaminated foods and health risk perspective for Pakistani population. Mycopath, 2006; 4(2):27-34.
5. Robens and Richard. Aflatoxins in animal and human health. Rev Environ Contamination Toxicol, 1992; 127:69-94.
6. Sun, et al. Determinants of formation of aflatoxin-albumin adducts: a seven-township study in Taiwan. Br J Cancer, 2002; 87:966-970.
7. Turner, et al. Modification of immune function through exposure to dietary aflatoxin in Gambian children. Environ Health Perspect, 2003; 111:217-220.