



Aflatoxin: From the dining table to cancer

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Editorial

Cancer prevention is usually associated with smoking, obesity, infections, genetics, and lifestyle (1). Yet some carcinogenic exposures are far less apparent and may enter the human body through everyday foods while remaining clinically silent for years. Aflatoxin is one such hidden threat.

Aflatoxins are mycotoxins produced primarily by *Aspergillus* species. Among them, aflatoxin B1 (AFB1) is of particular concern because of its potent carcinogenicity and established classification as a human carcinogen (2).

This issue is particularly relevant to Golestan Province in northeastern Iran, a region historically recognized for its high incidence of esophageal cancer. Our studies have demonstrated aflatoxin contamination in wheat and wheat flour, raising the possibility that dietary exposure may contribute to the environmental component of cancer risk in this population (3).

Esophageal cancer is undoubtedly multifactorial, and aflatoxin cannot be considered its sole cause. Nevertheless, the presence of a well-established carcinogen in a major staple food warrants attention.

The biological link between aflatoxin and carcinogenesis is compelling. Following metabolic activation, AFB1 forms highly reactive intermediates that can bind to DNA and induce genetic damage. This damage may affect critical genes involved in cellular regulation, including TP53, providing a plausible pathway from environmental exposure to genomic instability and cancer (4).

The strongest evidence concerns hepatocellular carcinoma, in which aflatoxin exposure and chronic hepatitis B infection act synergistically to increase the risk of liver cancer (5).

Aflatoxin is therefore not merely a food-safety concern; it is also a cancer-prevention concern.

Laboratory medicine plays an important role in detecting and quantifying this otherwise invisible exposure. Our research, including recent work exploring biological approaches to reducing AFB1 toxicity, highlights the need to move beyond detection toward preventing and reducing human exposure.

Aflatoxin may be invisible on the plate, but its molecular consequences may persist long after exposure.

Perhaps it is time to consider aflatoxin not merely a food contaminant but a preventable target in cancer control.

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