PRACTIONER TECH SHEET | Aflatoxin

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Aflatoxins as a class are acutely toxic, especially Aflatoxin B1. This mycotoxin and its metabolites are carcinogenic, mutagenic, cause liver injury, such as hepatitis and cirrhosis, and are correlated with hepatocellular carcinoma. Aflatoxin is the most potent hepatocarcinogen recognized in mammals and is listed as a Group I carcinogen by the International Agency for Research on Cancer.

Pulmonary effects lead to increased susceptibility to respiratory viral infections primarily due to immune impairment. Aflatoxin's propensity to reduce defenses against viruses may explain its association with virally-induced carcinomas.

Aflatoxin is a teratogen, and in pregnant women, may increase the risk for anemia, premature birth, and pregnancy loss.

If allowed to be converted to its reactive epoxide by mono-oxygenase enzyme systems (cytochrome P450-dependent), Aflatoxin causes rampant oxidative stress leading to cytotoxicity, including apoptosis and genotoxicity to nucleic acids and proteins, such as DNA and RNA.

Phase II conjugation to glutathione (mediated by glutathione S-transferase) is a key detoxification pathway. Aflatoxins are secondarily hydroxylated and demethylated. Polymorphisms in CYP3A5 affect susceptibility.

HEALTH IMPACTS

Hepatotoxic, hepatocarcinogenic, nephrotoxic, carcinogenic, mutagenic, genotoxic, teratogenic, immunotoxic, neurotoxic, cardiotoxic.

Liver. Potential to cause hepatitis, cirrhosis, and liver immunological damage. Aflatoxin has a causal association with hepatocellular carcinoma, which includes a synergistic interaction with Hepatitis B, as well as EBV reactivation, and EBV-associated Burkitt's lymphoma.

Respiratory. Induces TNF-α-dependent lung inflammation, enhancing oxidative DNA damage to alveolar cells. According to pulmonary studies on mice with swine influenza virus, Aflatoxin enhanced viral replication, inflammation, hemorrhage, and necrosis of the lungs.

Immune. Suppresses innate and acquired immunity at subacute levels. Decreases lymphocytes & sIgA. Induces activation of the EBV lytic cycle, increasing EBV load and triggering EBV-driven cellular transformation in primary human B cells, acting as a cofactor in EBV-mediated carcinogenesis.

GI. Microbiome alterations by reduction of beneficial bacteria accompanied with an increase in gut pathogens, such as shiga-toxin producing E.Coli.

MOLD SOURCES

Aspergillus flavus, A. parasiticus

COLOR

Tend to be light green, but can take on any color, even "black mold" color, depending on substrate

FAVORITE BUILDING MATERIAL

Flooring, concrete, carpet, plywood, drywall, ceiling tiles, paper, cardboard, modified wood products, leather

SIGNS

Dark Urine

SYMPTOMS

Fatigue
Insomnia
Anemia
Progressive inflammation
Metabolic acidosis
Accelerated aging
Reduced immunity
Cognitive dysfunction or decline
Incoordination
Headache
Visual fatigue
Chronic sinusitis
Hepatic pain or fullness
Loss of appetite
Nausea, vomiting
Dysbiosis
Jaundice
Hepatocellular carcinoma
Chemical sensitivity
Toxic metal accumulation
Steroidal hormone imbalance
Miscarriage or preterm birth
Stunted growth in children

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Pregnancy. Crosses the placenta. Increases the risk of adverse birth outcomes and impairs intrauterine fetal growth. In neonates, it lowers birth weight, reduces head circumference, and increases risk of jaundice in addition to developmental, behavioral, and reproductive consequences.

Growth. Correlated with growth suppression and malnutrition in children.

Neurotoxic. Stops cell cycle progression and proliferation in human brain astrocytes by increasing the mitochondrial depolarization, oxidative stress, and calcium influx in both the cytosol and mitochondria.

TREATMENT OPTIONS

*Note: the doses listed are intended for when each item is used as a standalone therapy. When multiple items are combined, they often work synergistically, meaning lower doses can typically achieve similar effectiveness due to their complementary effects.

Therapeutic Diet ~
Antioxidant-rich diet, including colorful fruits and vegetables, such as berries, leafy greens, beets, bell peppers, and brassicaceae family vegetables—broccoli, kale, cauliflower, Brussel sprouts, cabbage, collards, rabe, radish.
Protein-rich diet high in essential fatty acids, such as wild-caught fish, wild game, pasture-raised chicken eggs.

Green tea. 2-4 cups daily. Protective against Aflatoxin-induced cell injury.

Binder. 2 Tbsp rice bran (ideally purple rice bran) daily as an insoluble fiber binder, possible antimutagen.

Vitamin D. Vitamin D receptor in intestine & kidney is significantly down-modulated after aflatoxin exposure.
Dose to lab values of 60-90 ng/ml (150-225 nmol/L) for a minimum of 3 months in order to up-regulate receptors.

Vitamin E as Tocotrienols. Immunoprotective.* (Aflatoxin-specific effect.)
Dose: 200IU daily.

DHA (docosahexaenoic acid). Hepatoprotective, chemopreventive.* (Aflatoxin-specific effect.)
Dose: 500mg up to three times daily with meals.

Turmeric (Curcuma longa). Hepatoprotective. Ameliorates Aflatoxin-induced lipid peroxidation.
Dose: 500mg up to two times daily. Start lower with sensitive patients.

Glutathione. Up to 450mg liposomal daily. Start very low if still exposed or sensitive.
Or use glutathione inducers if not tolerated - ALA, NAC, Selenium, Milk thistle.

Melatonin. Hepatoprotective, cardioprotective. Can be used as a pre-treatment for known exposure events.
Dose: start 1mg nightly and titrate to 20mg as tolerated.
Dose at dinnertime to mitigate morning grogginess.

Quercetin. Hepatoprotective, nephroprotective by reducing albumin binding, and genoprotective against Aflatoxin.
Dose: 300mg up to four times daily.

Resveratrol. Chemopreventive, genoprotective.* (Aflatoxin-specific effect.)
Initial minimum therapeutic dose: 1 gram trans-resveratrol daily x 2 weeks to reach desired plasma concentration.
Follow with maintenance dose: 500mg daily.

Grape seed extract. Alleviates Aflatoxin-induced immunotoxicity and oxidative stress.
Dose: 600mg up to two times daily.

Red sage (Salvia miltiorrhiza/Danshen). Hepatoprotective.* (Aflatoxin-specific effect.)
Dose: 500mg up to three times daily.

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