**ADVERSE HEALTH EFFECTS ASSOCIATED WITH AFLATOXIN HAZARD.**

**BY BRIAN JERRY,**

**WRITERBASE SOLUTION.**

**JUNE 2024.**

**1.INTRODUCTION.**

Health is an important element for production and quality life worldwide.Food intoxication has posed a negative impact on health with aflatoxin bieng the most predominant causing aflatoxicosis. Aflatoxin is usually produced by A. *flavus* and A . *parasiticus* growing in poorly handled foods tha have provided a suitable microenviront for the fungal growt mostly affecting farming communities depending on animal and crop products as their staple food. Transmission of the toxin occurs via ingestion of contaminated food , contact and inhalation. Entry into the body, the toxin causes disruption of the body's constituents that includes the immune system, nutrition, genetics and growth and development due to its pathological characteristics that includes carcinogenicity, immuno suppressant and nutritient depriving characteristic that has led to development of cancers, nutritional disorders, increased susceptibility to infections that are difficult to treat especially in this era of emerging multidrug resistance. These conditions have negative effect on people's lives as they have led to increased morbidity and mortality, hospital stays, poverty due to their expensive management demand, disability and suffering, hunger and disease spread depriving the affected ones from quality life.

**Key words ; aflatoxin, carcinogen, immuno suppressor and nutrient depriving agent.**

**1.1 Aflatoxin as a carcinogenic agent.**

Cancer is one of the leading conditions causing death, disability and poverty due to its costly management worldwide as it also paves way for other disorders to thrive . Like any other toxin, on exposure, aflatoxins have the ability to cause cellular injuries associated with organelles dysfunction as they are potent carcinogens having the ability to cause DNA alterations via alkylation causing mutations. They also interfere with oxidative phosphorylation leading to production of reactive oxygen species from the mitochondria having a negative impact on nucleic acid and proteins. The two effects on the cell become effective because of the aflatoxin gene silencing mechanism as in the gene encoding for glutathione synthase essential for synthesis of glutathione to protect the cell against reactive species and the Tp53 gene, a tumor suppressor gene that induces apoptosis of transformed cells. These gene modifications have mantained telomeres at a constant state from shortening each time the cells having transformed DNA divide hence these cells cannot be arrested at a senescent phase for apoptosis to occur giving them the immortality characteristic. The most affected cells are those of the liver where th toxins metabolism takes place leading to hepatocellular carcinoma that deprives the liver its functions leading to abnormalities such as oedema due to impaired albumin synthesis, bleeding due to deficient synthesis of cloting factors and jaundice due to impaired bilirubin conjugation. Other organs that are infiltrated by the toxin causing cancer are the pancreas associated with diabetes mellitus due to insulin deficiency, the bone leading to immobility and pancytopenia, and the kidneys associated with oedema due to water and electrolyte imbalances, coma due to urea accumulation in the body tissues especially in the brain and anemia due to erythropoietin hormone deficiency, a key hormone for erythropoiesis. Most of this conditions require organ transplant, artificial aided function such as dialysis for kidney failure, and supplements eg insulin that are expensive procedures that cannot be affordable by all making it difficult for attaining quality health care services.

**1.2 Aflatoxin as an immuno suppresor.**

Aflatoxins have led to immuno suppression that has increased susceptibility to infections including the opportunistic ones by disruption of body defenses such as the skin in contact with the toxin develops lesions that can be affected bt the skin's normal flora eg Staphylococcus species causing microbial wounds infections difficult to treat especially in this era of multidrug resistance that is costly as a multidrug resistant organisms have limited treatment options as seen by shifting of one drug class to another of effective action for a particular microbe eradication, increased hospital stays due to delayed healing , increased spread of skin diseases caused by the bacteria, disabilities due to infiltration of the bacteria into body tissue such as the bones causing osteomyelitis that increases dependancy ratio between the sick and healthy and death as the bacteria causes serious conditions such as endocarditis.The epithelium may also be affected by the toxin causing ulceration that provides entry of gut microbiome into the body tissues causing infections. Infiltration of the toxin into the bone marrow deprives the hematopoietic stem cells their pluripotent characteristic leading to defective leukopoiesis increasing susceptibility to bacterial, fungal, helmintic and viral infections that is dangerous for those who are already immunocompromised by conditions such as AIDS and , those having weak immune systems such as the elderly having age related immunity changes and infants having underdeveloped immune system.

**1.3 Aflatoxin as a nutrient depriving agent.**

Nutrition is an important factor for good health. Aflatoxins have led to the development of nutritional disorders as a result of nutrition deficiency in several ways. One of the most common way is through enhancing malabsorption by destruction of the intestinal epithelial integrity causing decreased absorption of metals and vitamins bringing about disorders such as anemia due to iron and vitamin B12 deficiency, hemorrhage due to vit k deficiency in addition to clotting factors deficiency as a result of liver failure and blindness due to vit A deficiency . It has also been associated with decreased protein synthesis and utilization leading to decreased enzyme and hormone synthesis that results to defective biochemical reactions associated with metabiolic diseases and protein energy malnutrition defects such as marasmus. Moreover, aflatoxins also have deleterious effects on nutrient content in animals product due to thier secretion in the products .

**CONCLUSION.**

Aflatoxins are world wide threat to public health causing suffering among the people involved as It's contamination in foods has been a predisposing factor to developing serious health conditions.