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Detection of Aflatoxin B1 in secondary school students in Al-Diwanyia city

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ABSTRACT

The purpose of this study is to investigate mycotoxin (Aflatoxin B1) in high school student blood samples. Thus, 350 blood samples were collected randomly from students in various schools in Al-diwanyia city, and then toxin was detected using ELIZA method. The results showed 287 (82%) of student were had aflatoxin in their blood in a different concentration varying from 2.301 to 3.245 ng/ml and these concentrations were high (2.610 to 3.245) n/L in male rather than female (2.301 to 2.541) ng/L. Intrahepatic AFTs-B1 is activated by the enzymes p450 hemogenic protein, which is reborn into AFTs-B1-8, 9 epoxide, which is responsible for the effects of cancer within the secreted organ. Based on the fact that AFB1 recorded the most important effects of strong malignant tumor disease in both humans and animals, and thanks to the acute problems related to the contamination of AF More attention has been paid to food and feed and its negative impact on public and economic health compared to various fungal toxins. Because absolute safety is incredibly difficult to achieve, many developing countries have tried to reduce aflatoxin toxicity under the rules that management exposure prohibits the limits of such toxins in food and feed. This research was therefore designed to determine the levels of aflatoxin B1 in secondary school students ' blood samples.

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INTRODUCTION

These are secondary metabolites of the Apergillus flavus and Aspergillus parasiticus genus of aflatoxinst. These molds are common contaminants of food, especially in the tropics (Gourama and Bullerman, 1995). These mycotoxins are highly toxic and poisoning the cancer plant. This is often reported as food contaminants. AFB1 is, in all likelihood, the best cytotoxic metabolites generated by bound fungi that are sometimes developed on food due to serious storage conditions. Chronic exposure AFB1 proves genetic, mutagenic and immune system desorders and a marked increase in liver cancer (HCC) (Abbes *et al.*, 2010; Abdel-Wahhab *et al.*, 2015).

Aflatoxin is found especially for tropical or climatic food products in a very wide range of peanuts. Certain foods include barley, figs, nuts and grains. Corn, peanuts, rice and various petroleum products were recorded polluted foods that contribute to the essential biology of the Asian region. Aflatoxin pollution in meat is an international fellowship. The degree of associates is inevitable and unpredictable even though complex agricultural storage and processing practices, which pose a significant challenge to food safety to pave the way for these mycotoxins, are not simply eliminated during the food process because of their stability against heat and physical and chemical treatments (Marin *et al.*, 2013). Con-

tamination of feed can, therefore, be an additive. A biological agent can trigger animal toxicity that is both acute and chronic. Effects such as the induction of acute liver damage from liver disease, tumors and different genetic effects are well documented. In modern times, human biological weapons ' acute toxicity is rarely encountered. Fever, fungal reaction, and jaundice may be signs (Boevre *et al.*, 2012). Human exposure to mycotoxins is mainly through the activity of contaminated foods, and inhalation of toxins in addition may occur more often due to exposure to activity, several ways are planned to control the spread of plant toxins in many food commodities; but there are no clear solutions. Long-term intake of mycotoxins is associated with internal system cancer. Animal studies have shown that hepatic liver tumors can develop in animals such as mice, hamsters and monkeys when taken orally for a long time (Kumar *et al.*, 2017).

Aflatoxin causes lower efficacy of immunization in young people, which increases the risk of infection (Hendrickse, 1997). Hepatocellular cancers of aflatoxin, especially due to lipid peroxide and aerobic DNA injury (Verma, 2004). Intrahepatic AFTs-B1 is activated by the enzymes p450 hemogenic protein, which is reborn into AFTs-B1-8, 9 epoxide, which is responsible for the effects of cancer within the secreted organ (Massey *et al.*, 1995).

Based on the fact that AFB1 recorded the most important effects of strong malignant tumor disease in both humans and animals, and thanks to the acute problems related to the contamination of AF More attention has been paid to food and feed and its negative impact on public and economic health compared to various fungal toxins. Because absolute safety is incredibly difficult to achieve, many developing countries have tried to reduce aflatoxin toxicity under the rules that management exposure prohibits the limits of such toxins in food and feed.

This research was therefore designed to determine the levels of aflatoxin B1 in secondary school students ' blood samples.

MATERIALS AND METHODS

After having the Ethical agreement of the secondary school managers , student's family and students themselves, we started blood specimens collection form students in different secondary schools in Al-Diwanyah city throughout the period from December 2017 till May 2018.

Specimens Collection

Blood samples from students were collected, blood serum samples were prepared and kept at $-20\ ^\circ$ C for detection of aflatoxins ELISA assay of aflatoxin

The presence of AFB1 was confirmed mistreatment associate immuno-enzymatic business kit in step with company directions supported organism antibodies specific for every of them (Transia, Lyon France). Briefly, the extract was gaseous to condition and brought up within the sample buffer provided in the kit; fifty μL of the sample was then pipetted into duplicate wells of associate enzyme-linked-immunosorbent serologic assay plate super sensitive with the antibody specific for bioarm B1. Following incubation and laundry, fifty μL of the precise antibody conjugated to peroxidase dissolved within the conjugate buffer provided in the kit was additional, incubated and washed once more before the substrate was additional and incubated for color development as suggested by the suppliers. Color intensity was scanned off an enzyme-linked-immunosorbent serologic assay reader given the kit. Standards enclosed within the kit allowed the calculation of bioarm in the extract assayed (Abbes *et al.*, 2010).

Statistical analysis of the data

In a datasheet, the data were tabulated and analyzed using the SPSS (Statistical Package for Social Sciences) version 20.0 computer program. Not far from Chi-Square. When the likelihood (P) value was 0.01, the difference was considered significant (Kirkpatrick and Feeney, 2013).

RESULTS AND DISCUSSION

Results showed that 287 (82%) of the 350 blood samples obtained from healthy high school students were infected with AFB1, Table 1. Thus, this study clarified that the highest percentage (85.86 percent) of AB1 blood specimens were recorded in Male while in Female (77.71 percent) was recorded in Table 2. With regard to the concentration of AB1 in blood samples shown in Table 3, the concentration of AFB1 in females ranged from 2,301 ng/ml to 2,541 ng/ml, whereas the concentration ranged from 2,610 ng / ml to 3,245ng / ml in males.

Aflatoxin is considered the first factor that naturally causes carcinogens (HCC); the effect of biological weapons on public health has also been detected in both acute and chronic exposure (Moulé, 2013; Wray and Hayes, 1980). Acute exposure to biological weapons (fungal poisoning) may end in sudden liver failure (Lewis *et al.*, 2005; Tchana *et al.*, 2010); chronic exposure to biological weapons has joined the development of HCC (Barton, 2000).

In our study, as we showed the students in high exposure to AFB1, this finding me belongs to the

Table 1: AFB1 includes the number and percentage ofspecimens

Case study	No .of specimens	No. of specimens have AFB1	Percentage
Secondary school Students	350	287	%82

Table 2: Sex distribution of positive AFB1 samples

Gender	No. of specimens	No .of specimens contain AFB1	Percentage
Female	166	129	%77.71
Male	184	158	%85.86

$X^{2cal.}$ =1.3 p≤ 0.01

Table 3: Positive specimen concentration of AFB1

Gender	Con .of AFB1(ng/ml)
Female	2.301-2.541
Male	2.610-3.245

consumption of contaminated foods by students. Contamination of mycotoxins in many foods can be a major threat to the health of vulnerable people. This emphasizes the importance of watching AFB1 and metabolites in food products (Ewaid *et al.*, 2020).

Children's exposure to environmental toxins, as well as the child's nutritional status, is vital for growth and the risk of developing adolescence. Deficiency disease is a common problem in developing countries. The presence of AFB1 in children's body fluids may be a potential risk of impaired growth during their development because it is known to inhibit the synthesis of supermolecules (Moulé, 2013; Ewaid and Abed, 2017).

Moreover, many researchers in African countries have a strong correlation between deficiency disease and, thus, the presence of a vital weapon in young body fluids (Williams *et al.*, 2004). As a result of the specific effect of biological weapons on the molecular synthesis, biological weapons in children's body fluids may be a moderate problem about the speed of recovery from molecular deficiency disease, although it has not been blamed if this condition occurs.

Furthermore, it is recommended that biological weapons Reducing food nutritional capacity by metabolic processes (Doyle *et al.*, 1977; Ewaid *et al.*, 2019a,b). Early exposure to AFB1 can be a source of primary cancer of the liver. Aflatoxins, hepatitis, alcohol and heels are accepted as high-risk factors for cancer development (Cardwell and Henry, 2004; Al-Zaidy *et al.*, 2019).

CONCLUSIONS

The results showed 287 (82%) of student were had aflatoxin in their blood in a different concentration varying from 2.301 to 3.245 ng/ml and these concentrations were high (2.610 to 3.245) n/L in male rather than female (2.301 to 2.541) ng/L. In addition, at levels above acceptable limits, aflatoxins tend to be found in foods recommended for children such as eggs and milk.

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