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Teratogenic Effect of an Environmental Mycotoxin Aflatoxin B1 (AFB1) on the Developing Chick Embryo with Reference to the Changes in Spinal Ganglia and surah Al A'raf 157

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Abstract: Objective: The work aimed to see the effect of Aflatoxin B1 (AFB1) on the developing spinal ganglia in chick embryos. Method: 120 fresh fertile Dokky4 eggs were used for this study. The eggs were divided into 3 groups. The eggs of the 1st group -20 eggs- were used as control .The second group 80 eggs was subdivided into two subgroups, A and B. Subgroup (A) was injected with half Toxic Dose ofTD50 = 0.5 micron aflatoxin B1 (AFB1) on the 8th day of incubation and the embryos were extracted on 9th day: Subgroup B was injected with aflatoxin B1 (AFB1) on the 15th thy of incubation and the embryos were extracted on the 16th day. The third group -20 eggs- were injected with the solvent: 10 of the eggs were injected on the 8th day and were opened on the 9th day of incubation. The other 10 eggs were injected on the 15th day of incubation and opened on the 16th day of incubation. The eggs were incubated under standard conditions. Results: Morphological changes in Aflatoxin (AFB1) treated embryos in size, colour and skin transparency besides limb and peak defects and deformities were present. Histology of the ganglion of 9 days old control and solvent treated embryos consisted of sheath formed of lemnoblasts, fibroblasts and little collagen fibres. The supportive tissue consisted of supportive undifferentiated cells and satellite cells surrounding the ganglioblasts and ganglionic cells. The ganglioblast and cells differed inizes and stains. They were granular with deeper stain at the periphery. Some degenerated cells and few plasma cells were seen. Spinal ganglion of 9 days aflatoxin (AFB1) treated embryos showed irregular sheath contents, congestion and increased vascularity. Ganglionic cells with different size and stains and dividing stages were noted. Free plasma cells, or in dilated vessels or between ganglionic cells were seen. Degenerated cells increased and cells with vacuolated cytoplasm were present. Free red blood cellsr RBCs were seen in the (AFB1) treated ganglion. Spinal ganglion of 16 days control and solvent treated embryo showed increase in the ganglionic size and cellular content with more development the ganglionic cells were granular differentiated in spite of the few ganglioblasts. They were pseudo unipolar cells with different size and stain. Satellite cells surrounded the ganglionic cells and the sheath was well formed and consisted of fibroblasts, collagen and blood vessels. Histological picture of aflatoxin (AFB1) treated embryos showed swelling enlargement of ganglionic cells with deep stain that increased density at cell periphery. Congested vessels full of blood cells were seen and free blood cells were observed between ganglionic cells. Some of the cells had vacuolated cytoplasm. Degenerated cells were present. The results were confirmed using the image analysis Leica Q 500 M C program .There was significant increase in the mean surface area of the ganglion cells of 9 days old Aflatoxin (AFB1) treated embryos ($P < 0.05$). There was highly significant increase in the mean surface area of the ganglion cells of 16 days old Aflatoxin (AFB1) treated embryos ($P<O.OOl$). Conclusion: It was concluded that Aflatoxin (AFB1) was teratogenic and caused changes in the spinal ganglia of the developing chick embryo. So pregnant women should avoid contaminated food with It. Pilgrims should avoid contaminated food with AFB1. The authority of pilgrimage should provide well preserved food. The authority of health .specially in Gynecology and obstetrics department dealing with pregnant mothers should publish information's about the harmful effects of eating AFB1toxins contaminated food.to avoid their risks. The research emphasizes the miraculous (الأعراف 157 -يحرم عليكم الخبائث) true fact in Quran and hadith narrated by the prophet Mohammed peace upon him that prohibited eating the bad food that contaminated by toxins of AFB1 especially in season of pilgrimage.

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Key words: spinal ganglia; Developing; chick embryo; Aflatoxin **(AFB1)**

Abbreviations AFB1 = Aflatoxin B, DME = N-N Dimethyl Forniatuide , TLC = Thin Layer Chromatography TD =Toxic Dose

1. Introduction

Mycotoxins were secondary products of fungal metabolism, causing harmful effects on human and animal health. The literature recoded many epedimic Major Mycotoxin Outbreaks in Pets in different counties all over the world and caused death of people.

These substances were commonly found in food, especially harvest storage or transport practices were inadequate. It was estimated The Food and Agriculture Organization (FAO) estimates that 25% of the world's food crops were affected by mycotoxins, of which the most were aflatoxins [**1**]. Acute intoxications were less common in humans, the effects of chronic exposure to mycotoxins had proved to be related to health disorders [**2**]. Aflatoxins had carcinogenic potential. Aflatoxins (AFs) were produced mainly by Aspergillus spp. fungi and were found in several foods, such as corn, peanuts and cottonseed. Aflatoxins were detected occasionally in milk, cheese, cottonseed, nuts, almonds, figs, spices, and a variety of other foods and feeds.

Milk, eggs, and meat products were sometimes contaminated because of the animal consumption of aflatoxin-contaminated feed.

However, the commodities with the highest risk of aflatoxin contamination are corn, peanuts, and

Temperature and humidity provided adequate conditions for contamination by Aspergillus spp. and the production of those mycotoxins [**3**].

Aspergillus produced directly some, whilst other AFs were the result of the metabolism of those substances in the liver after intake. The four main types of aflatoxins found in foods were variants B1, B2, G1, and G2, with aflatoxin B1 (AFB1) having the highest carcinogenic potential. Aflatoxin M1 (AFM1) was a product of aflatoxin B1 metabolism in the animal organism, and had carcinogenic potential and was excreted in the milk of animals and humans [**4**]. AFB1 proved to have mutagenic, genotoxic, immunogenic, and hepatotoxic effects, and caused acute liver damage when ingested in large quantities. It also had a remarkable teratogenic potential. Many studies were carried out on its effects during the prenatal life of animals and humans, especially on fetal development.

Mycotoxin had the ability to cross the placental barrier and had been identified in human umbilical cord samples [**5**,**6**],

Mechanism of Action of Aflatoxin B1 and Biotransformation

AFB1 was absorbed from the intestine and reached the liver to be metabolized by oxidases. AFB1 went biotransformation; in the first stage, then pathways, producing several metabolites, followed by the conjugation process for excretion . AFB1 might go through a reversible reduction process in the cytoplasmic reeducates system of hepatocytes, forming aflatoxicol (AFL), which could be transformed into AFB1, becoming a source of its own storage. Metabolization of AFB1 culminated with the formation of several metabolites, e.g., aflatoxin P1 (AFP1) and aflatoxin Q1 (AFQ1) [**7**].

Among the metabolization pathways of AFB1, the peroxidation process. In that process, AFB1 was converted into AFB1-8.9-epoxide (AFBO), which was able to bind to macromolecules, such as those of DNA, RNA, and proteins, forming adducts responsible for the toxic potential of the aflatoxins [**8**].

2. Material and methods

120Doky4 fertilized eggs were used and divided into3 groups: The first group: 20eggs as control group. The eggs were opened in the 9th day of incubation.10eggs were opened in the day16th of incubation. The second group was divided into A&B groups. Group A consisted of 40 eggs were injected with aflatoxinB1 (AFB1) in the eighth day 8 of incubation and opened in the 9th day of incubation. Group B consisted of 40 eggs were injected with aflatoxinB1in day 15 of incubation and opened in the 16th day of incubation. The injection was by the TD50 in the day 15 of incubation. The third group consisted of 20 eggs. 10eggs were injected by the solvent OPYLENE GLYCOL on the day 8 and opened in the day 9 of incubation. 10eggs were injected by the solvent OPYLENE GLYCOL on the day 15 and opened in the day16 of incubation. The injection was according to Allam et al. (9). The eggs were incubated under standard condition s of humidity and temperature37 in electrical incubators.

Dissection of the thoracic region that contained the spinal ganglia in all the embryo groups: the control, injected by AFTB1, and the solvent.

The specimens were fixed in formalin 10%for 10days then put in paraffin wax, and then sections were prepared for histological examination by light microscope after cutting at 8micron thickness by the microtome. Suitable stains were used: H&E was for general histological examination, Masson trichrom for collagen detection of the capsule, and toluidine blue foe the Nissle granules in the ganglioblasts [10].

Aflatoxin B1 (AFB1) and solvent Opylene Glycol

AflatoxinB1 (AFB1) was crystalline from sigma as shown by Chromatography (TLC) AflatoxinB1 (AFB1) showed ultraviolet Peals at 223,265 &360nm in methanole as recommended by A.O.A.C. [11]

The solvent used was OPYLENE GLYCO.

Morphometric and statistical study

Determined (P = (0.05 < non-significant. (P <0.05 = (significant, (P< 01)01) highly significant statistical study was done using the SPSS program

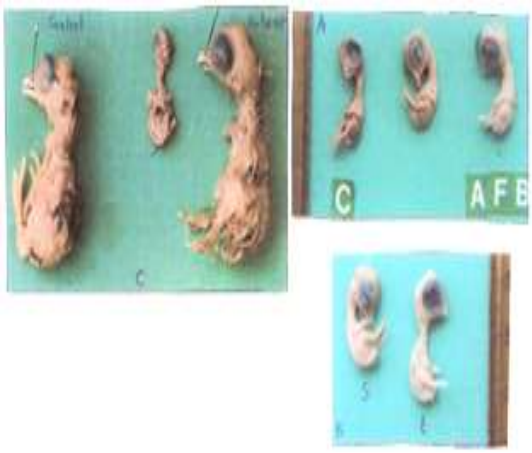
The mean surface area of the ganglion cells of 9 and 16 days old control and Aflatoxin B1 treated embryos was measured. The measurements were-done in five different fields from five different sections. This was done in twenty different chick embryos from the **control and** the treated groups .The measurements were done by using the image analysis Leica Q 500 M C program - Students **t** test was used to compare the the mean surface area of the ganglion cells of 9 and 16 days old control and Aflatoxin BI treated embryos. P value was determined (P > 0.05) = non-significant. (P <0.05) = significant, (P< 01)01) highly significant statistical study was done using the SPSS program

RESULTS:

Morphological results: (Figs.A ,B &C)

Morphological examining of the chick embryos treated with the toxic dose of aflatoxin (AFB1, showed changes in the external features and shape in the chick embryos. There were changes in skin color and its transpareny.

1. Deformities in the limbs and Peak.
2. There was a general decrease in size
3. Some chick embryos were absorbed and some of them died.
4. The movement of the chick embryos extracted from the eggs was very weak when opening the eggs injected with aflatoxin AFB1
5. It was found that 50% of the embryos that were injected on the eighth 8th day with aflatoxin B1 and were extracted on the ninth day .had died.
6. 60% of the embryos treated with aflatoxin on the fifteenth and 15th day AFB 1and were extracted on the sixteenth day died,
7. The movement of chik embryos extracted treated with aflatoxinB1 was sluggish
8. Some morphological changes were observed in the embryos injected with aflatoxin on the ninth day (Figs. A & B)
9. The embryos injected with aflatoxinB1 and treated with the solvent were larger in size than the control group.
10. The color of the skin of the treated chick embryos with the solvent changed to white, and the skin was transparent in the chick embryos treated with aflatoxin.AFB1.
11. The beak of AFB1-treated chick embryos was smaller and more fragile than that of the control group.
12. The following morphological changes were observed in AFB1-treated embryos on day 16 (Figure C)
13. The beak was more fragile, incompletely and shorter compared to the control group.
14. Deformities, ABSENCE OF PART and a shortage of the lower limbs.
15. The size of the fetuses treated with AFB1 was larger than the control group



Figs (A.B and C) showing treated embryos with the toxic dose of aflatoxin (AFB1), showed changes in the external features and shape in the chick embryos. There are changes in skin color and its transparency.

Deformities in the limbs and Peak.
u There is a general decrease in size
Some chick embryos are absorbed and some died

Histological Results

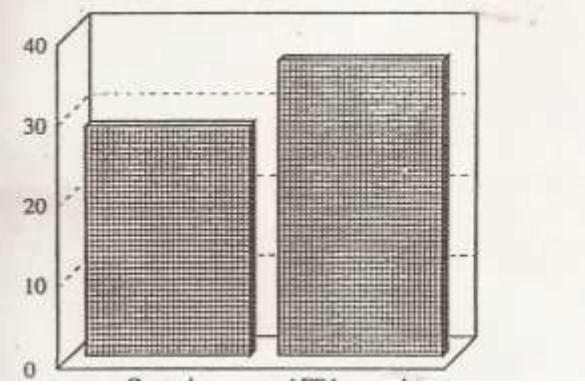
1.a. Spinal ganglia of 9 days control and solvent treated embryos (Figs1&2):

Histological examination of parts of TS of part of Spinal ganglia of the ganglion of 9 days old control and solvent treated embryos consisted of capsule formed of sheath formed of lemnoblasts, fibroblasts and little collagen fibres.The supportive tissue consisted of supportive undifferentiated cells and some satellite cells surrounding the ganglioblasts and ganglionic cells. The ganglioblats tables (1&2) they were granular with deeper stain at the periphery. Some degenerated cells and few plasma cells were seen (Figs1&2).

Table 1: Showing the mean surface area of the spinal ganglion cells in both the control and A FB I treated groups at 9 days chick embryos

Control group		AFB1 treated group				
Mean	SD	Mean	SD	t	P	Sig
28.34	8.2	36.42	11.44	2.56	<(105	S

There is a significant increase in the mean surface area of the spinal ganglion cells in AFB1 treated group as compared to the control (P<O.05).



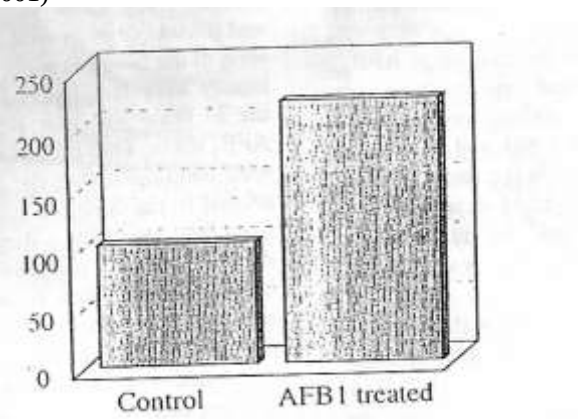
Control AFB I treated

Histogram showing the mean surface area of the spinal ganglion cells in both the control and AFB I treated groups at 9 days chick embryos.

Table 2- Showing the mean surface area of the spinal ganglion cells in both the control and A FB I treated groups at 16 days chick embryos

Control group		AFBI treated group				
:Mean	SD	Mean	SD	t	P	Sig
101	55.62	219.72	72.64	5.7	<0.00!	HS

There is a highly significant increase in the mean surface area of the spinal ganglion cells of the AFB I treated group as compared to the control group (P<0. 001)



Histogram showing the mean surface area of the spinal ganglion cells in both the control and AFB I treated groups at 16 days chick embryos

Fig1: Photomicrograph of part of TS of a thoracic vertebra showing two spinal ganglion right and left of control 9 days old chick embryo in the inter vertebral space. Toluidine blue x4

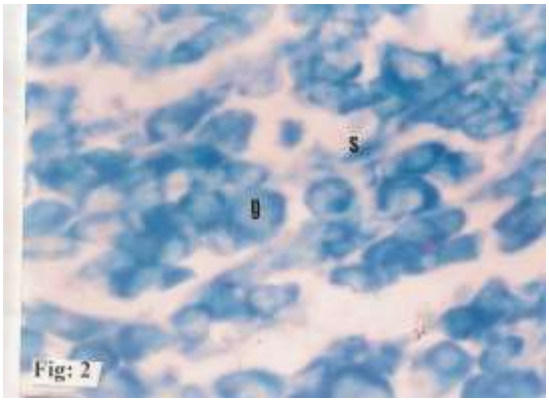


Fig2 : Photomicrograph of part of TS of part of a spinal ganglion of 9dys old chick embryo showing PART OF THE HISTOLOGIC tissue the thoracic spinal ganglia between the vertebra containing gahglionic (g)and satellite cells (s)Toluidine blue x 40

b. Spinal ganglia of 9 day's aflatoxin AFB I **treated embryos (Figs. 3-5):1**

Histological examination of parts of TS of part of the spinal ganglion of the age of 9days,showed that the cells were irregularly arranged, the ganglia was full of dilated blood vessels and plasma cells between the cells. That was present in toluidine stain sections (Figs. 3&4) Satellite cells were large. Ganglionic cells had many vacuoles. Some cells had granular cytoplasm with peripheral deep cytoplasm and irregular. Some undifferentiated cells were seen. There was significant increase in the mean surface area of the ganglion cells of 9 days old AflatoxinB1 treated embryos (P <0.05) table 1. & Fig. 5

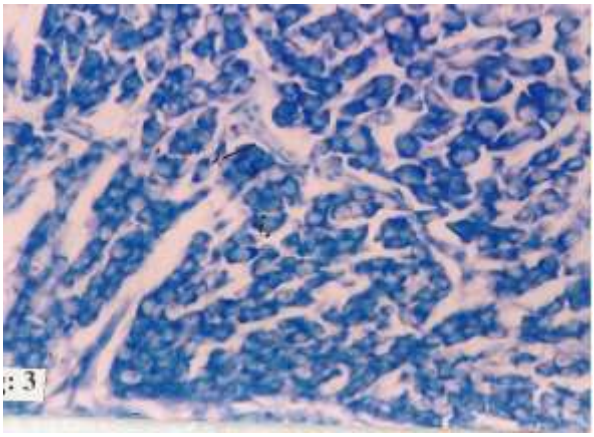


Fig 3: Photomicrograph of part of TS of part of a spinal ganglion of 9dys old chick embryo treated with the solvent showing the big undifferentiated cells, Notice the branched cell and the satellite cells. And the deep peripheral stains of the ganglia, Toluidine blue ×1000

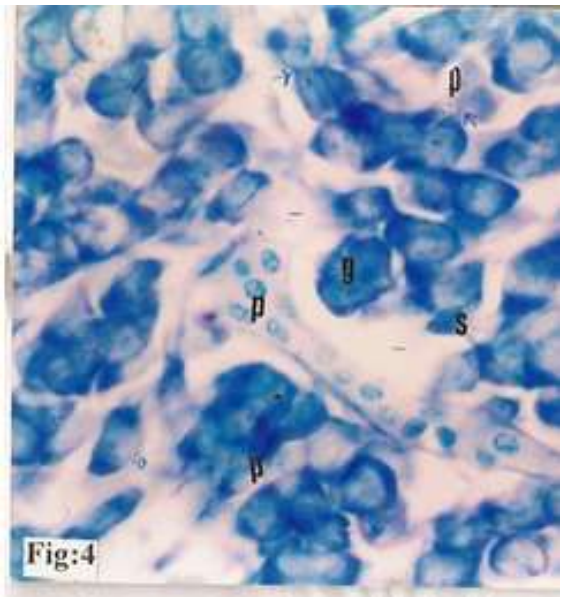


Fig4: Photomicrograph of part of TS of part of a spinal ganglion of 9dys old chick embryo aflatoxin **AFB I** treated showing irregular large ganglionic (G)cells and satellite cells(s)
Notice the plasma cells and blood vessels, Toluidine blue ×400

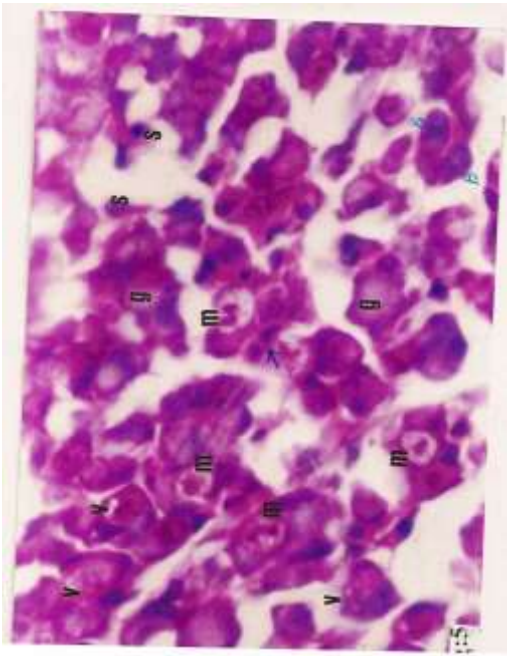


Fig5: Photomicrograph of part of TS of part of a spinal ganglion of 9dys old chick embryo aflatoxin treated showing -the large ganglionic cells with deep stain at the periphery of the cells .Notice the plasma cells, Toluidine blue ×1000

2.a. Spinal ganglia of 16 days control and solvent treated embryos (Figs. 6-8):

Histological examination of parts of TS of part of Spinal ganglia showed that the ganglia were present as collection of ganglionic cells between the vertebrae, forming the dorsal spinal root (Figs. 6)The ganglia increase size. The ganglionic cells had different size, different cellular content with more development than the previous age were noted. The ganglionic cells were granular differentiated inspite of the few ganglioblasts. They were pseudo unipolar cells with different size and stain. Satellite cells surrounded the ganglionic cells and the sheath was well formed and consisted of fibroblasts. (Figs. 6-8) collagen and blood vessels. Nissle granules were noted in sections stained by toluidine blue. (Figs. 6)Some degenerated cells were seen.

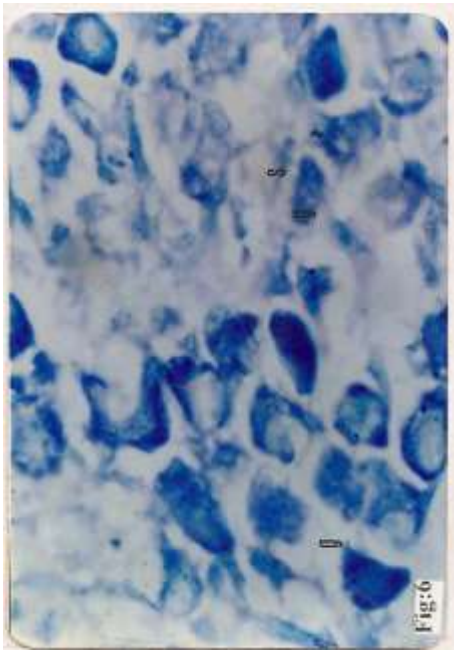


Fig 6: Photomicrograph of part of TS of part of a spinal ganglion of 9dys old chick embryo aflatoxin AFB1 treated showing cells with different size, shape and stain affinity. Some cells aggregated. Note that satellite cells with basophilic stain. Note the cytoplasme is fuul of vacuoles and deep peripheral stain. Note the difference between the mature large cells and the deeply stained small immature cells. H&E ×1000

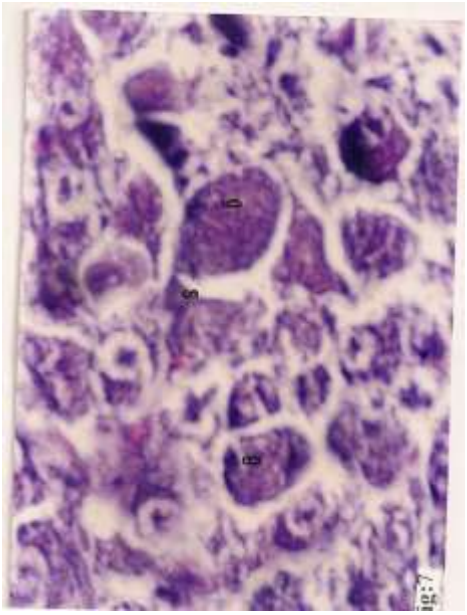


Fig7 -Photomicrograph of part of TS of part of a spinal ganglion of 16 days old chick embryo aflatoxin AFB1 treated showing the content of the gangliobIasts and the deep stain at the periphery and the different sized cells Toluidine blue ×1000

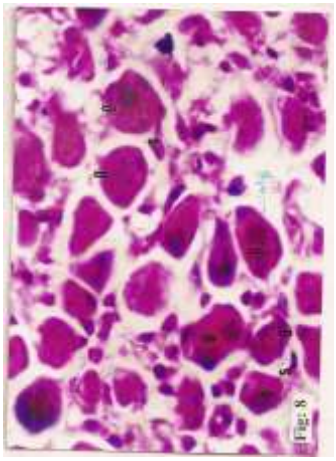


Fig 8 Photomicrograph of part of TS of part of a control spinal ganglion of 16 days old chick embryo showing the different sized and stain ganglioblasts ( )g . and satelite cells (S) . Notice the colagen and blood vessels. Mason triple stain, × 1000

2-b. Spinal ganglia of 16 days aflatoxin treated embryos (Figs. 9&10):

Histological picture of aflatoxin treated embryos showed swelling enlargement of ganglionic cells with deep stain that increased density at cell periphery. Congested vessels full of blood cells were seen and free blood cells were observed between ganglionic cells. Some of the cells had vacuolated cytoplasm. Degenerated cells were present. The results were confirmed using the image analysis Leica Q 500 M C program. There was highly significant increase in the mean surface area of the ganglion cells of 16 days old Aflatoxin B1 treated embryos (P<O.OOl).

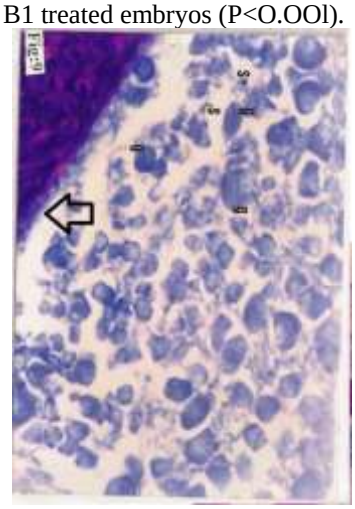


Fig 9 Photomicrograph of part of TS of part of a spinal ganglion of 16 days old chick embryo AFB1 treated showing the different sized and stained ganglionic cells (g)and he satellite cells(S) .H&E × 1000

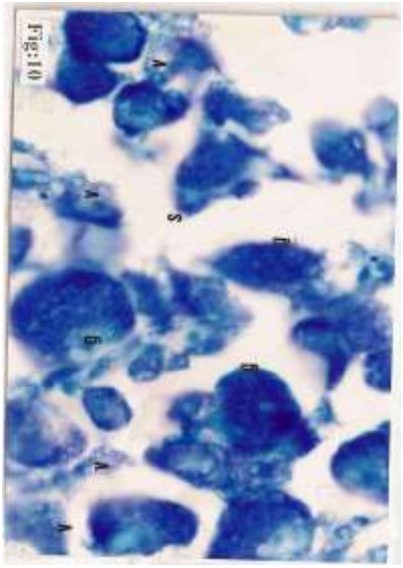


Fig10: Photomicrograph of part of TS of part of a spinal ganglion of 16 days old chick embryo AFB1 treated showing the different ENLARGED sized and stained ganglionic cells (g)and he satellite cells(S)Note the wide spaces between the ganglioblast.
The satellit dells are irreglarly arranged.
Toluidine blue ×1000

4. Discussion:

Morphological and histological changes in chick embryos aged 9 and 16 days in the present work within 24 hours after injection of aflatoxin AFB1 were observed. Morphological changes were in small sized injected embryos, resorption and death. deformities in bones, peak, limbs,as parts of the limbs had disappeared. Changes in the skin color were noted. It was found that 50% of the embryos that were injected on the eighth 8th day with afflation B1 and were extracted on the ninth day .had died.

%60 -of the embryos treated with aflatoxin on the fifteenth and 15th day AFB 1and were extracted on the sixteenth day died.

The results of the present work agreed with The Food and Agriculture Organization (FAO) who estimated that 25% of the world's food crops were affected by mycotoxins, of which the most notorious were aflatoxins. Aflatoxin lost to livestock and poultry producers from aflatoxin-contaminated feeds included death and the more subtle effects of immune system suppression, reduced growth rates, and losses in feed efficiency. Other adverse economic effects of aflatoxins included lower yields for food and fiber crops.

In addition, the ability of aflatoxins to cause cancer and related diseases in humans gave their seemingly unavoidable occurrence in foods and feeds made the prevention and detoxification of those mycotoxins one of the most challenging toxicology issues of present time.

Histological changes included dilation of blood vessels in the stroma of the spinal ganglia of the chick embryos treated with aflatoxin AFB1 at the age of 9 days. There were free RBCs between the ganglion tissues of 16-day-old chick embryos. Aflatoxin AFB1 treatment. Changes in the shape, size of ganglion cells that filled with vacuoles were noted and satellite cells were irregularly arranged. The ganglion cells were swollen and the contents of the cell were not clear. Also, pigment changes occurred. There were wide spaces between the cells.

The changes in the ganglionic cells were in the form of degenerations, gaps between the cells, vacuoles and swelling in the cytoplasm of the cells. The resulting changes and degenerative changes in the ganglionic cytoplasm might result from the direct effect of aflatoxin AB1 toxin.

The result of je present work agreed with Hsiesh's observations [12] who noted that the aflatoxins that the animals ingested turned into highly reactive components, Aflatoxin B - epoxide, that could bind to the centers of the nucleus and DNA & RNA to be adducts.

Covalent bonding between B - epoxide or B - diol to functioning macromolecules. Functioning macromolecules caused chemical damage that could lead to biological manifestations of the effects of B1 and related substances. While some of the B residues present in the tissues of animals that were eaten, while the non-toxic part could react of B1 bound to the microflora of the gut and stomach in and became toxic as was its free B metabolites.

The increased surface area of ganglion cells in this work can be considered as a result of the direct irritant effect of aflatoxin AFB1on the cells. The changes were more significant in ganglia in 16-day-old chick embryos treated with aflatoxin AFB1.

This agreed with Battifora [13], who attributed cell enlargement to the irritant effect.

The results of this research showed that there was a significant increase in the average surface area of ganglion cells in chicken embryos at the age of 9 days, and there was a high significant increase in the average surface area of ganglion cells in chick embryos at the age of 16 days. The change in significance could be due to a change in the sensitivity of the cells during the development and growth of the chick embryos during age progress.

Hayes et al. [14] stated that the harmful effects of aflatoxin were due to the metabolization of aflatoxin AFB1 to aflatoxin 8-9 AFB-epoxide 8&9,

which was a compound that acts as a mutagen and an alkylating agent. The toxic effects of aflatoxin on different cells varied. It could change the sensitivity of the cells to the toxin changed markedly and significantly during development, and could be modified upon treatment with xenobiotics.

Changes in the coagulation mechanism in aflatoxin-treated chick embryos could be the reason for the significant increase in red blood cells and plasma cells, whether free or in the vasculature of the ganglion.

This agreed with Chaffee et al. [15], who noticed bleeding in some organs of dogs when they were given mixed aflatoxin. They suggested that the effect of liver cells as a result of the toxin had a direct effect on prothrombin time.

Borbell, et al. [16] suggested that the effect of aflatoxin on the clotting process was due to the competition of the Coumarin moiety in it with vitamin K, which was responsible for the manufacture of some clotting factors. They added that aflatoxin inhibits the manufacture of protein, so it could decrease the concentration of fibrogen in plasma.

This was similar to the results of Ungar et al. [17], who recorded that Syrian hamsters treated with a single dose of intraperitoneal crystal aflatoxin caused hemorrhage in the lung, liver, adrenal glands, intestines, and kidneys. Hemorrhages attributed this to interference in the process of blood clotting.

In this work, an increase in erythrocytes, plasma cells, and ganglion hematopoiesis was observed in chicken embryos treated with aflatoxin. This could be the result of increased vascular permeability due to the effect of aflatoxin.

This agreed with William et al. [18], who stated that the stroma was related to the accessory cells and contained mast cells and a denser network of blood vessels around the ganglion cells. The capillaries in rodents did not have fenestrated openings and had openings in the Primitive mammals. And Williams et, al., added that the permeability of blood vessels varied according to different types of organisms, to reach the formation of the blood –nerve barrier, some of which depended largely on the functional complexes between endothelial cells – They added that the details were not possible in humans.

The presence of very large ganglion cells may be due to the effect of aflatoxin on the ganglion cells, as it causes inhibition of cell division, mitosis, and the cessation of the deoxyribonucleic acid (DNA) industry.

The results of the present research agreed with Legator [19], who discovered giant cell formation, inhibition of mitosis, and a halt to DNA synthesis within the first few hours after exposure of a tissue culture to aflatoxin AFB1.

It was noted in this work the death and resorption of embryos treated with aflatoxin AFB1 and the presence of skin color, many limb and peak deformities. The reason for this could be due to the mutagenic effect of aflatoxins AFB1 and the sensitivity of the cells.

The results of the present work agreed with da Silva et al. [20] reviewed the literature in the past 20 years on the effects of AFB1of prenatal exposure to Aflatoxin B1. They discussed pathophysiological mechanisms on embryological and fetal development in animal species, and humans. They discussed the effects, already reported in the scientific literature, of the pathophysiological mechanisms of AFB1 on embryological and fetal development in mice, rats and rabbits and human exposed in the prenatal period and the impacts on health of fetuses and newborns. Thy collected data from, the ISI Web of Knowledge, PubMed, Google Scholar, and Scopus databases, and searched: ‘‘Aflatoxin’’, ‘‘prenatal exposure’’, ‘‘human’’, and ‘‘teratogenicity’’.

da Silva et al. [20] mentioned that Aflatoxins were mycotoxins produced as secondary fungal metabolites. Aflatoxin B1 (AFB1) had genotoxic and mutagenic potential, and was potent initiator of carcinogenesis. AFB1 had a teratogenic effect, resulting in bone malformations, visceral anomalies, lesions in several organs, and behavioral and reproductive changes, in addition to low birth weight. The mutagenic capacity of AFB1 in prenatal life was greater than in adults, indicating that when exposure occurred in the womb, the risk of the development of neoplasms was higher. Studies on humans indicated that exposure to AFB1 mycotoxin during pregnancy was associated with low birth weight, decreased head circumference, and DNA hypermethylation. The actual impacts on humans were still unclear, the importance of that issue could not be overemphasized and studies on the matter were essential'

It was concluded that Aflatoxin was teratogenic and caused changes in the spinal ganglia of the developing chick embryo. So pregnant women should avoid contaminated food with it. .

أ) النص المعجز (يحرم عليكم الخبائث) 157 الأعراف
- بعض معاني الكلمات كما جاء في مختار الصحاح: (يحرم , الخبيث).
ح رم :(الحرم)بوزن القفل الإحرام. قالت عائشة رضي الله عنها :"كنت أطيب رسول الله صلي الله غليه وسلم لحاه وحرمه" أي عند إحرامه.والحرمة ما لايحل انتهاكه وكذا(المحرمة)بضم الراء وفتحها وقد (تحرم) بصحبته .و(حرمة) الرجل (حرمه) وأهله ورجل(حرام) أي(محرم) والجمع(حرم) مثل قدال وقدل .و من الشهور أربعة حرم أيضاً وهي :ذو القعدة وذو الحجة والمحرم ورجب

الأجنة . وبذلك يتفق نتئج البحث الغلمي مع الأحاديث و الآية الكريمة157 الاعراف .

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ثلاثة سرد وواحد فرد .وكانت العرب لاتستحل فيها القتال إلا حَيان خثعم وطيئ فانهما كانا يستحلان الشهور. و(الحرام) ضد الحلال وكذا(الحرم) بالكسر وقرئ: "وحرم علي قرية أهلكناها" وقال الكسايئ: معناه واجب . و(الحرمة) بالكسر القامة . وفي الحديث "الذين تدركهم الساعة تبعث عليهم الحرمة ويسلبون الحياء" ومكة(حرم) الله. و(الحرمان) مكة والمدينة. (والحرم) قد يكون الحرام مثل زمن وزمان .و(المحرم الحرام) ويقال هو ذو(محرم)منها إذا لم يحل نكاحها.ومحرم أول الشهور .و(التحريم) ضد التحليل . و(حريم) البئر وغيرها ما حولها من مرافقها وحقوقها. و(حرم)الشيئ بالضم يحرم (حرمة)و(حرمت) الصلاة علي الحائض (حرما)و(حرمت)أيضاً من باب فهم لغة فيه (وحرمه)الشيئ يحرمه (حرما) بكسر الراء فيهما مثل سرقه فسرقه سرقا و(حرمة) و(حريمة) و(حرمانا) وأحرمه أيضا إذا منعه إياه . و(احرم) الرجل دخل في الشهر الحرام . واحرم بالحج والعمرة لأنه يحرم عليه ما كان حلالا من كالصيد والنساء .(ألإحرام) أيضاً بمعني التحريم يقال (أحرمه) و(حرمه) بمعني . وقوله تعالي "للسائل والمحروم." قال ابن عباس رضي الله عنهما :هو المحارف.

خ ب ث : (الخبيث) ضد الطيب وقد (خبث) الشئ بالضم (خباثة) و(خبث) الرجل بالضم أيضا (خبثا) فهو (خبيث) أي خب ردئ و(أخبثه) علمه الخبث وأفسده (وأخبث) الرجل اتخذ أصحاباً خبثاء فهو(خبيث مخبث) بكسر الباء (ومخبثان) بوزن زعفران و(المخبثة) بوزن المتربة المفسدة ومنه قول عنترة* والكفر مخبثة لنفس المنعم* (وخبث) الحديد وغيره بفتحتين ما نفاه الكير. و(الأخبثان) البول والغائط.

جاء في مختار الصحاح (الخبيث)ضد الطيب

النصوص القرآنية التي تحث علي أكل الطيب وتجنب الخبيث: (يحرم عليكم الخبائث) 157 الأعراف .

*كلوا من طيبات ما رزقناكم .البقرة--- 57،172 و160 ألأعراف و طه20

*كلوا من الطيبات51- المؤمنون

* وكلوا مما رزقكم الله حلالا طيبا---88 المائدة

فكلوا مما رزقكم الله حلالا طيبا--------114 النحل*

كلوا مما في الأرض حلالا طيبا—168 البقرة*

تفسير النص :

ذكر ابن كثير أن الخبائث هي لحم الخنزير و الربا و ما كان يستحلونه من المحرمات والمآكل التي حرمها الله . وقال بعض العلماء كل ما أحل الله تعالي من المآكل فهو طيب نافع في البدن والدين. وكل ما حرمه فهو خبيث ضار في البدن والدين .

ذكر ألإمامين الجلالين: (يحرم عليكم الخبائث)من الميتة ونحوها.

وأشار عز الدين بن عبد السلام في تفسير الخبائث انه:لحم الخنزير والدماء.

جاء في تفسير السعدي: (يحرم عليكم الخبائث) من المطاعم ، والمشارب ، والمناكح، والأقوال و ألأفعال .

ذكر أبو بكر الجزائري : أن الخبائث جمع خبيثة كالميتة مثلا.

وأكد الصابوني في تفسير يحرم عليهم الخبائث هي ما يستخبث من الدم والميتة ولحم الخنزير .

النصوص من الأحاديث النبوية الشريفة التي تحث علي أكل الطيب وتجنب الخبيث:

عن أبي هريرة نهي رسول الله عن الدواء الخبيث . قال وكيع السم رواه ابن ماجه.

أخرجه ابن ماجه في :31 –كتاب الطب باب النهي عن الدواء الخبيث. الحديث 3459 ، ص(2:1145).

أخرجه أبو داود والترمذي في الطب ،وأحمد في المسند (2:305)

والحديث يوضح النهي عن الخبيث و وكيع فسره بالسم .ومن أنواع السم هو ماينتج من الأسبرجلس ويسبب خبث الأطعمة وتشوه

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