New York Science Journal

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Protective Effect of Fish Oil and Evening Primrose Oil against Fenitrothion Induced Toxicity in Male Rats

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Abstract: The present study was to investigate the influence of fish oil and evening primrose oil against the toxicity of fenitrothion on the histological structure of liver, kidney and testes in male rats. Sixty-three rats were randomly distributed into seven experimental groups, nine male rats each: Control group, fenitrothion treated group, fish oil treated group, evening primrose oil treated group, fish oil and fenitrothion treated group, evening primrose oil and fenitrothion group, fish oils and evening Primrose with fenitrothion group. The results showed that exposed to fenitrothion for 30 days attenuated histopathological alterations on these organs and also showed that these oils have preventive effects on fenitrothion toxicity.
[Aljadani, N.A.; Elnaggar, M.H.R., and Assaggaff, A.I. **Protective Effect of Fish Oil and Evening Primrose Oil against Fenitrothion Induced Toxicity in Male Rats.** *N Y Sci J* 2020;13(4):20-30]. ISSN 1554-0200 (print); ISSN 2375-723X (online). http://www.sciencepub.net/newyork. 3. doi:10.7537/marsnys130420.03.

Key words: Fenitrothion; fish oil; evening primrose oil; liver; kidney; testis; blood; rats; histology.

1. Introduction

Many researches have been done on the various fenitrothion concentration which causes histopathological influence on the kidney and liver of rats and suppresses their immunity (Hayes and Laws, 1991; Afshar *et al.,* 2008a; Elhalwagy *et al.,* 2008; Budin *et al.,* 2013). After entering through oral administration, fenitrothion (FNT) has a capability to get extensively and rapidly absorbed through the intestinal tract if mammals, from where it gets distributed to the blood, carcass, and liver (Afshar *et al*., 2008b). Moreover, the toxicity caused by organophosphorus insecticides outcomes the negative influence on a diverse amount of systems and organs in the mammalian body such as nervous system, kidney, liver, reproductive system and immune system (Elzoghby *et al.,* 2014). The kidney is one of the main target organs during the experiments on animals exposed by OP compounds. (Mansour and Mossa, 2010).

The investigation carried out by Abdel-Ghany *et al.* (2016) on the oral administration of fenitrothion (10 mg/kg) on kidney and liver function in rats. The influence of dose was examined on the days 7,14,21,28 and 42. They found that the substantial gradual damage for 7, 14, 21,28 and 42 days in tissues of liver which has initiated by the jumbled patters of lobular in hepatic parenchyma, leading to congested hepatic tissue and programmed apoptosis, focal necrosis, flaring of hepatic sinusoids as well as swelling in the residual hepatic parenchyma, which ends with the interstitial lymphocytic accumulation and thickening of interlobular edematous fibrous tissue. Furthermore, the researcher has also studied that the fenitrothion instigated steady and substantial histopathological alteration in tissues of kidney initiated from the minute variation in tubules of renal besides glomeruli at the cortical site and finale at the adverse worsening condition of kidney tissues as compared to a group that was in control.

Tahoun *et al.* (2018) examined the histopathological alteration in kidney and liver of rat group exposed to fenitrothion pesticide. From the perspective of liver tissues, the central vein embeds at the mid of the lobule which is surrounded by the hepatocytes having strong dissimilar nuclei and the eosinophilic granulated cytoplasm. Moreover, in the intermediate of the hepatocytes strands, the hepatic sinusoids are displayed. The examination of histopathology shows that the liver that previously treated by fenitrothion in rats exhibits the mobbing of vessels of a portal, recent formation of the bile duct and the hydropic deterioration of hepatocyte. Furthermore, the large regions of coagulative necrosis permeated with lymphocytes in the portal region. The fenitrothion addition with the green tea group shows the normal depiction excluding one single necrosis of cell. Whereas, FNT and Vitamin C group showed the slight congestion in the central vein and Kupfer cell hyperplasia with the hepatic sinusoids. Furthermore, the study shows that the examination of histopathology of kidney posts oral administration of

fenitrothion for a six weeks treatment, as a result, the group shows weakening and necrosis of glomerular cluster, interstitial tissue edema and renal tubules cloudy swelling with the hyaline cast. It is noted that as the exposure of fenitrothion duration increases deterioration in the renal tubules is been observed.

Abdel Reheim *et al.* (2008) studied the influence of fenitrothion on kidney and liver of rats treated with three doses of fenitrothion (1/20, 1/40 and 1/80 LD_{50}) in absence and presence of vitamin E. They found vacuolar degeneration of focal hepatic hemorrhage and hepatocytes in the liver of rat. The damage in kidney tissues of rat exposed to fenitrothion exhibits the endothelial lining glomerular tufts vacuolations, focal renal hemorrhage, and epithelial lining of renal tubules. They concluded that fenitrothion exert biochemical, mutagenic and histopathological effects in rats, and added that, vitamin E has mild role in alleviating these toxicological effects.

The study done by Taib *et al.* (2013) estimated the influence of fenitrothion on the testes and sperms of the male rats. They showed that seminiferous tubules comprise spermatogenic and normal somatic cells which are fenced by the peritubular myoid cells. Also, Leydig's cell clusters observed in the intertubular space which has a close acquaintance with the lymphatic channels and blood vessels. Whereas, deterioration of germ cells, interstitial space expansion, spermatogonia disarrangement in rat testes seminiferous tubule. Leydig cells deterioration and the cellular debris availability in the lumen in rat testes seminiferous tubules observed in the group of fenitrothion.

The defensive impact of Quercetin (QR) on fenitrothion (FNT)-induced testicular poisonous quality in rats, was studied by Saber *et al.* (2016). They recognized sperm parameters and histopathological changes in testicles. Also, serum testosterone and luteinizing hormone were evaluated utilizing radioimmunoassay packs. FNT caused critical declines in sperm tally, motility and hormonal levels, a noteworthy increment in unusual sperm morphology and a huge down regulation of steroidogenic and cell reinforcement qualities in the testis. In any case, QR organization enhanced FNT-induced lethal impacts. They presumed that QR viably relieved testicular harm instigated by FNT in rats.

Taib *et al.* (2014) studied the effects of palm oil tocotrienol-rich fraction (TRF) in reducing the detrimental effects occurring in spermatozoa of fenitrothion (FNT)-treated rats. They found that, supplementation with TRF weakened the detrimental effects of FNT by increasing sperm counts, motility, and viability and decreased the abnormal sperm morphology. They added that, superoxide dismutase (SOD) activity and reduced glutathione (GSH) level were significantly increased, whereas malondialdehyde (MDA) and protein carbonyl (PC) levels were decreased in the TRF+FNT group compared with the rats receiving FNT alone. TRF significantly decreased the DNA damage in the sperm of FNT-treated rats. TRF showed the potential to reduce the detrimental effects occurring in spermatozoa of FNT-treated rats.

Materials and methods

Experimental Animals:

Adult male albino rats of the Wistar strain (*Rattus norvegicus*) weighing 150–220 g were used in the present study. Rats were housed in standard plastic cages and maintained under controlled laboratory conditions of humidity (65%), temperature (20±1°C) and 12:12 h light: dark cycle. Rats were fed on normal commercial chow and had free access to water *ad libitum*. The experimental treatments were conducted in accordance with ethical guidelines of the Animal Care and Use Committee of King Abdulaziz University.

Experimental design:

A total of sixty-three rats randomly distributed into seven experimental groups, nine male rats each and the experimental groups were treated as follows:

1- Rats of group 1 were untreated and served as control.

2- Rats of group 2 were orally administered 1/10 LD_{50} of fenitrothion (30 mg/kg b.w.) dose by using the stomach tube day after day for four weeks.

3- Rats of group 3 were orally administered with 300 mg/kg b.w. of fish oil by using the stomach tube day after day for four weeks.

4- Rats of group 4 were orally administered with 300 mg/kg b.w. of evening primrose oil by using the stomach tube day after day for four weeks.

5- Rats of group 5 were orally administered with 300 mg/kg b.w. of fish oil then given 1/10 LD_{50} of fenitrothion (30 mg/kg b.w.) dose by using the stomach tube day after day for four weeks.

6- Rats of group 6 were orally administered with 300 mg/kg b.w. of evening primrose oil and then given 1/10 LD_{50} of fenitrothion (30 mg/kg b.w.) dose by using the stomach tube day after day for four weeks.

7- Rats of group 7 were orally administered with 300 mg/kg b.w. of evening primrose oil and 300 mg/kg b.w. of fish oil then given 1/10 LD_{50} of fenitrothion (30 mg/kg b.w.) dose by using the stomach tube day after day for four weeks.

Histopathological Examinations

At the end of the experiment (30 days) and after blood sampling, liver, kidney and testis were isolated from each group, fixed in 10% neutral formalin

solution. Fixed tissues were processed, and then embedded in paraffin blocks. Sectioned of 4 µm thickness and stained with Hematoxylin and Eosin. Then liver, kidney and testis were examined using microscope (Olympus Bx-Ucb - USA) and photographed by a camera (Olympus DP72- USA).

3. Results

Histological sections in the livers of control rats (group 1) showed hepatic cords radiating from the central vein and were separated by blood sinusoids (Figure 1A). In addition, the portal tract containing branches of portal vein, hepatic artery and bile duct were demonstrated (Figure 1B). However, the liver of rats received fenitrothion (group 2) showed multiple areas of focal necrosis and disorganized hepatic cords. Necrotic hepatocytes had darkly acidophilic cytoplasm and pyknotic nuclei. Inflammatory Cellular infiltrations were also seen. (Figs. 2 A,B). Furthermore, the liver of rats in group 3 that were treated by fish oil showed regular hepatic cords and apparently normal portal areas; portal vein, hepatic artery and hepatic duct. (Figure. 3 A,B). While the liver tissue of rats treated with evening primrose oil (group 4) showed apparently normal hepatocytes radiating from a central vein (Figure 4A). The portal area showed small branches of portal vein, hepatic artery, and bile duct. Slightly dilated congested blood sinusoids were seen compared with control group (Figure 4B). On the other hand, the liver tissue of rats treated with fish oil and fenitrothion in group 5 showed nearly normal hepatocytes radiating from a central vein and also the portal area showed small branches of portal vein, hepatic artery, and bile duct. Few inflammatory cells and prominent Kupffer cells were seen (Figure 5 A,B). The liver of rats received evening primrose oil with fenitrothion in group 6 showed apparently normal hepatocytes radiating from a central vein. Also, the portal area showed small branches of portal vein, hepatic artery, and bile duct. However, blood sinusoids were dilated, and congested, and mitotic figures were also noted compared with control group (Figure 6 A.B). The liver of rats treated by Fish oil, Evening primrose oil and fenitrothion in group 7 showed regular hepatic cords radiating from a central vein; the portal area showed small branches of portal vein, hepatic artery, and bile duct. Few degenerated cells were also seen (Figure 7A,B.).

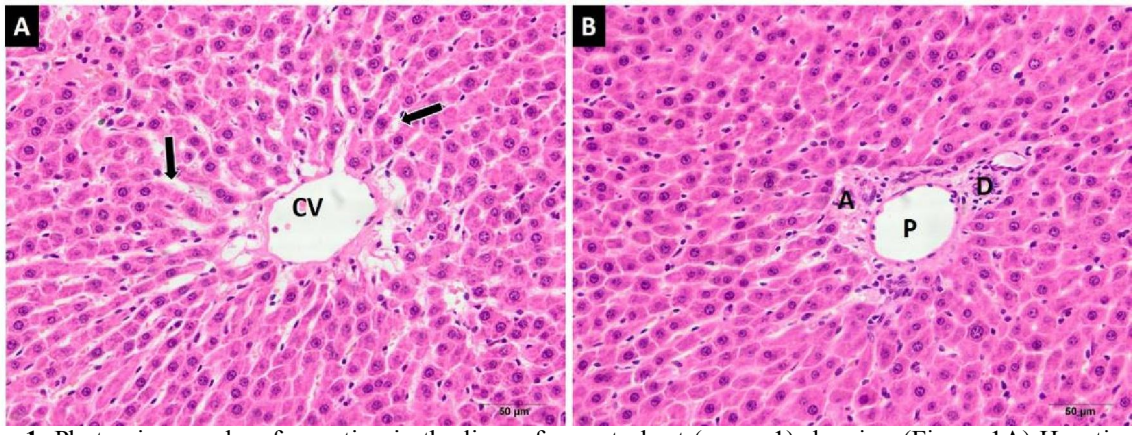

Figure 1. Photomicrographs of a section in the liver of a control rat (group 1) showing (Figure 1A) Hepatic cords radiating from the central vein (CV) and separated by blood sinusoids (arrows); (Figure 1B) the portal tract containing branches of portal vein (P), hepatic artery (A) and bile duct (D). (H & E × 400)

Histological sections in the kidney of control rats (group 1) showed normal renal architecture: glomerulus, proximal and distal convoluted tubules (Figure 8). On the other hand, the kidney tissue of fenitrothion treated rats (group 2) showed dilated and congested glomerular capillary loops and vacuolization of tubular epithelial cells. Homogenous eosinophilic casts were seen in some tubules. Dilated and congested blood vessels and interstitial hemorrhages (Figure 9). While sections in the kidney of fish oil treated rats (group 3) showed normal pattern of renal architecture: glomerulus, proximal and distal convoluted tubules (Figure 10). In addition, the kidney tissue of primrose oil treated rats (group 4) showed nearly normal renal architecture (Figure 11). Though, the kidney tissue of rats co-treated with fenitrothion and fish oil (group 5) displayed the majority of the glomeruli and tubules were normal. However, patchy tubular dilatation was apparent (Figure 12). Furthermore, the kidney tissue of rats co-treated with fenitrothion and primrose oil (group 6) showed nearly normal renal architecture. However, slight glomerular congestion, was also noted compared with control group (Figure 13). While

sections in the kidney of rats co-treated with fenitrothion with fish oil and evening primrose oil (group 7) showed normal histological structure of glomeruli and proximal and distal tubules (Figure 14).

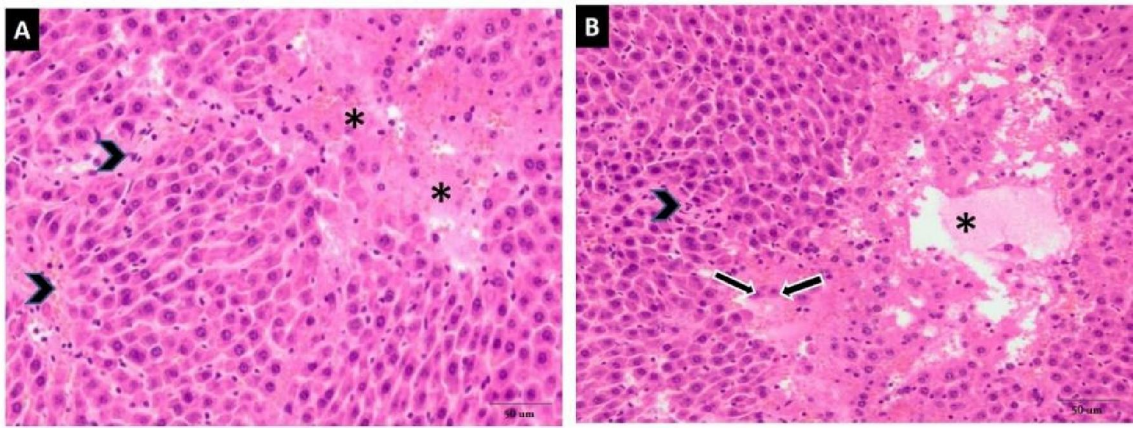

Figure 2. Photomicrographs of a section in the liver of rats received fenitrothion (group 2) showing multiple areas of focal necrosis and disorganized hepatic cords. Necrotic hepatocytes have darkly acidophilic cytoplasm and pyknotic nuclei (arrows). Inflammatory Cellular infiltrations (arrowheads) are also seen. (H & E × 400)

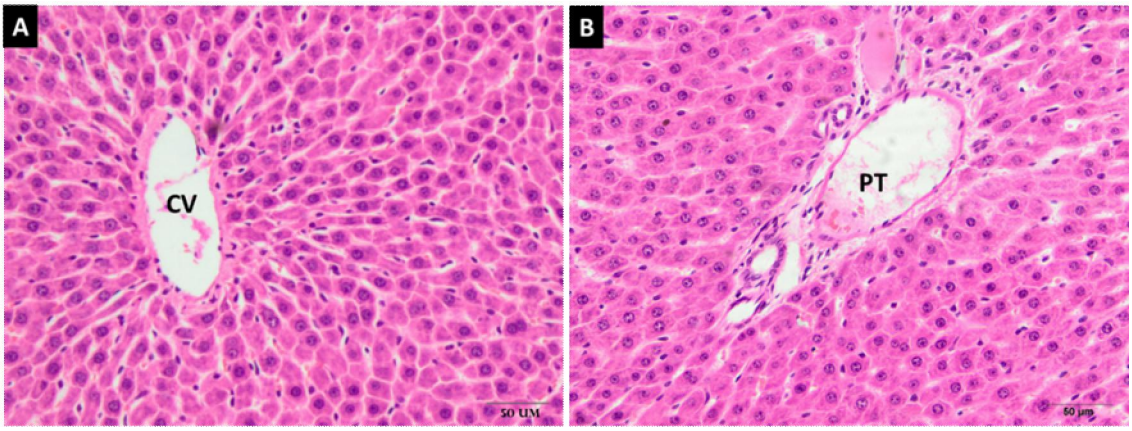

Figure 3. Photomicrographs of a section in the liver of rats that were treated by fish oil group 3 showing (Figure 3A) regular hepatic cords and (Figure 3B) apparently normal portal area (PT); portal vein, hepatic artery and hepatic duct). (H & E × 400)

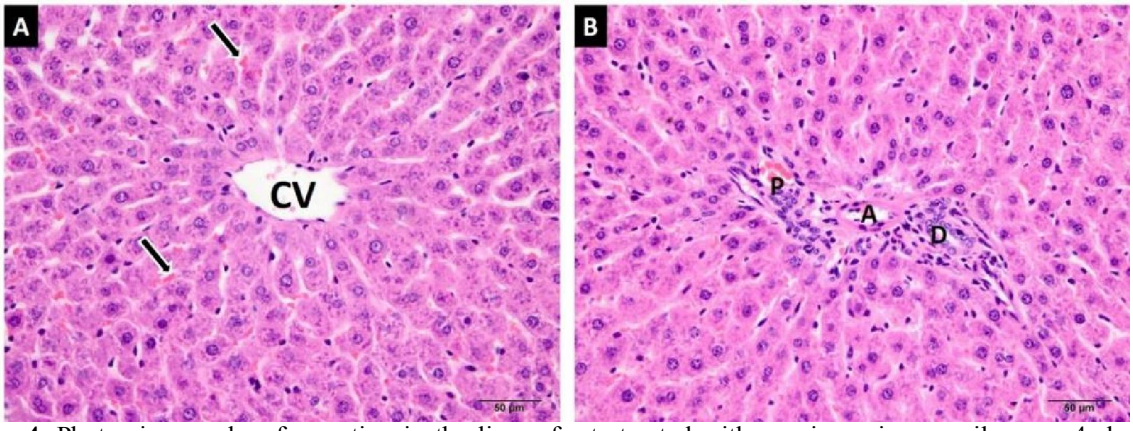

Figure 4. Photomicrographs of a section in the liver of rats treated with evening primrose oil group 4 showing (Figure 4A) apparently normal hepatocytes radiating from a central vein (CV); (Figure 4B) the portal area show small branches of portal vein (P), hepatic artery (A), and bile duct (D). Slightly dilated congested blood sinusoids are seen (arrows). (H & E A× 400).

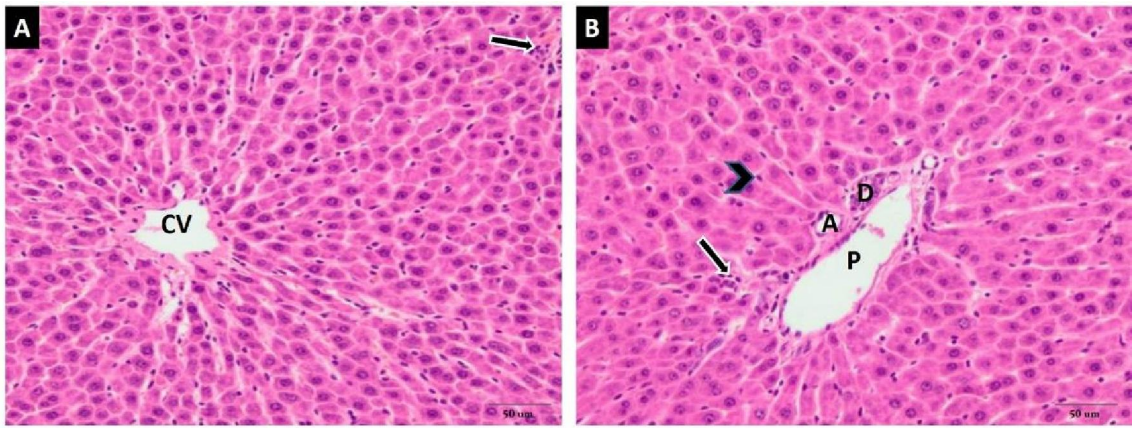

Figure 5. Photomicrographs of a section in the liver of rats treated with fish oil and fenitrothion group 5 showing (Figure 5A) nearly normal hepatocytes radiating from a central vein (CV); (Figure 5B) the portal area show small branches of portal vein (P), hepatic artery (A), and bile duct (D). Few inflammatory cells (arrows) and prominent Kupffer cells are seen (arrowheads). (H & E × 400)

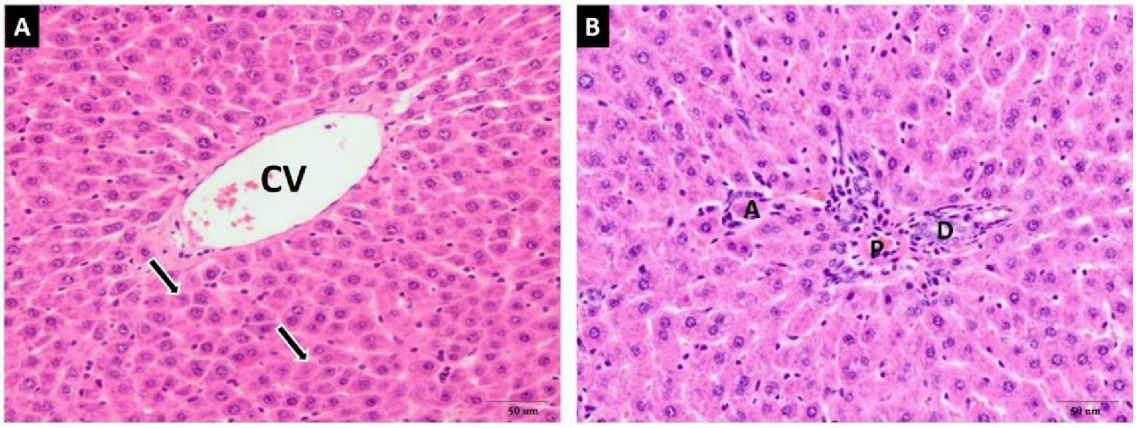

Figure 6. Photomicrographs of a section in the liver of rats received evening primrose oil with fenitrothion group 6 showing (Figure 6A) apparently normal hepatocytes radiating from a central vein (CV); (Figure 6B) the portal area show small branches of portal vein (P), hepatic artery (A), and bile duct (D). Blood sinusoids are dilated and congested (arrows). Mitotic figures are also noted (arrowheads) (H & E A× 400).

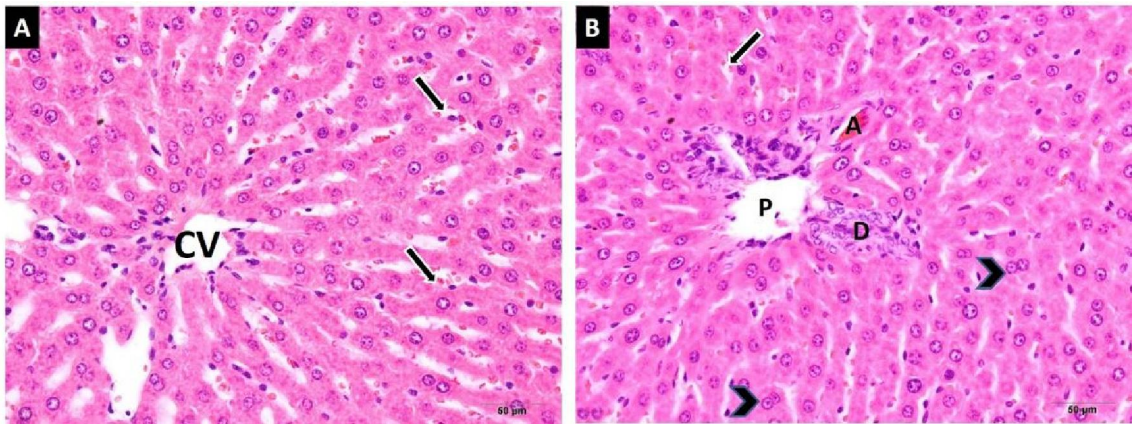

Figure 7. Photomicrographs of a section in the liver of rats treated by Fish oil, Evening primrose oil and fenitrothion group 7 showing (Figure 7A) regular hepatic cords radiating from a central vein (CV); (Figure 7B) the portal area show small branches of portal vein (P), hepatic artery (A), and bile duct (D). Few degenerated cells are seen (arrows). (H & E A× 400)

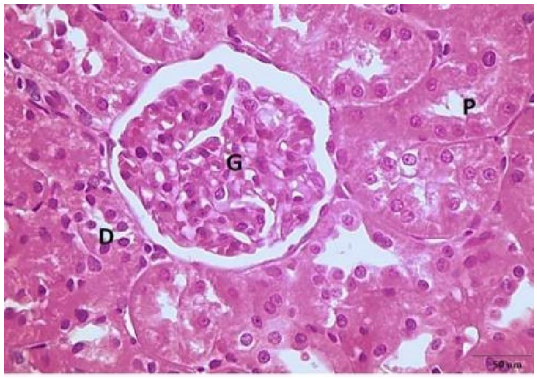

Figure 8. A photomicrograph of a section in the kidney of a control rat (group 1) showing normal renal architecture: glomerulus (G), proximal (P) and distal (D) convoluted tubules. (H & E × 400)

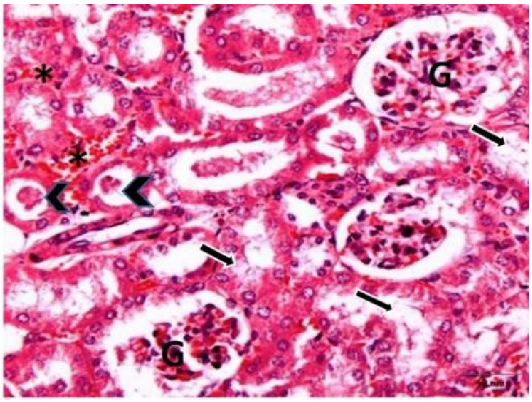

Figure 9. A Photomicrograph of a section in the kidney of a fenitrothion treated rat (group 2) demonstrating dilated and congested glomerular capillary loops (G) and vacuolization of tubular epithelial cells (arrows). Homogenous eosinophilic casts are seen in some tubules (arrowheads). Dilated and congested blood vessels and interstitial hemorrhages (stars) (H & E × 400).

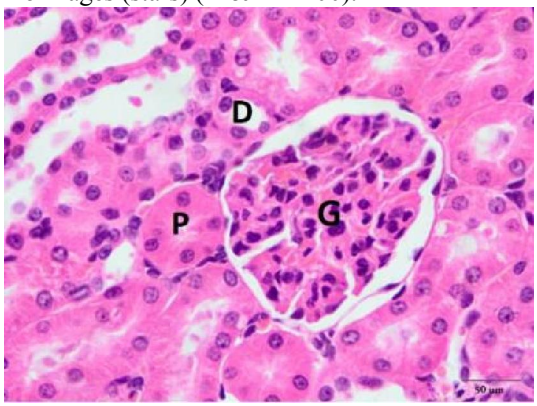

Figure 10. A photomicrograph of a section in the kidney of fish oil treated rat (group 3) showing normal pattern of renal architecture: glomerulus (G), proximal (P) and distal (D) convoluted tubules. (H & E × 400)

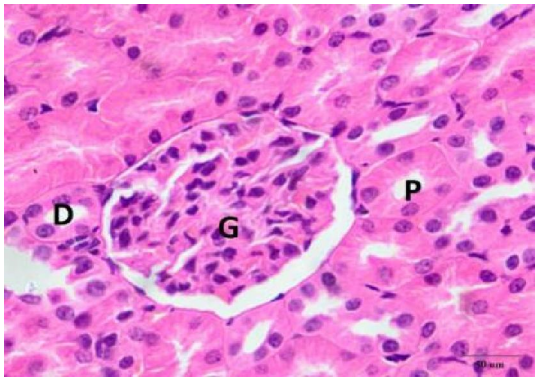

Figure 11. A photomicrograph of a section in the kidney of primrose oil treated rat (group 3) showing nearly normal renal architecture. (H & E × 400)

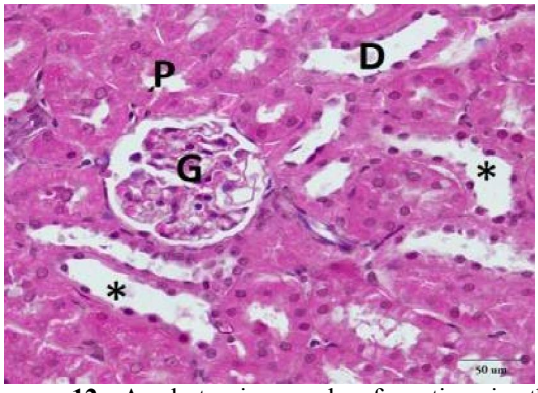

Figure 12. A photomicrograph of section in the kidney of a rat co-treated with fish oil plus fenitrothion (group 5) showing the majority of the glomeruli (G) and tubules (P & D) are normal. However, patchy tubular dilatation is apparent (stars). (H & E × 400) `

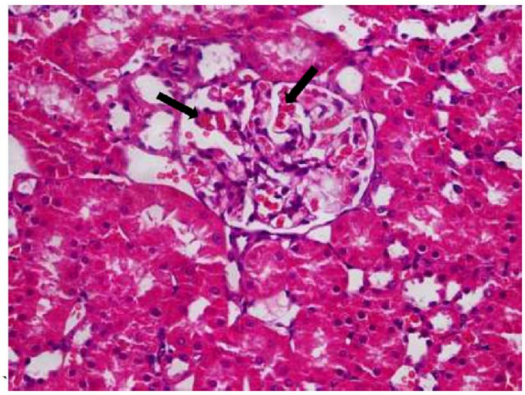

Figure 13. A photomicrograph of section in the kidney of a rat co-treated with evening primrose oil plus fenitrothion (group 6) showing nearly normal renal architecture. However, slight glomerular congestion, is also noted. (H & E × 400)

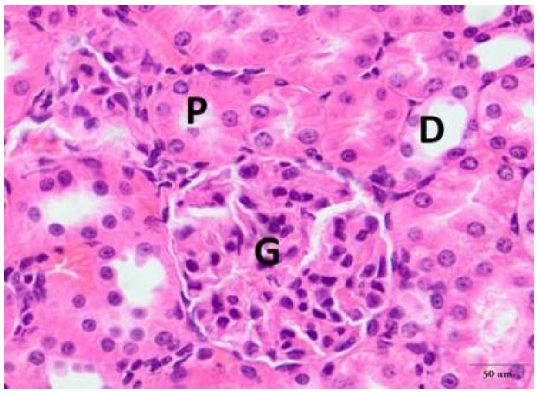

Figure 14. A photomicrograph of a section in the kidney of a rat co-treated with fenitrothion with fish oil and evening primrose oil (group 7) showing normal histological structure of glomeruli (G) and proximal (P) and distal tubules (D). (H & E × 400)

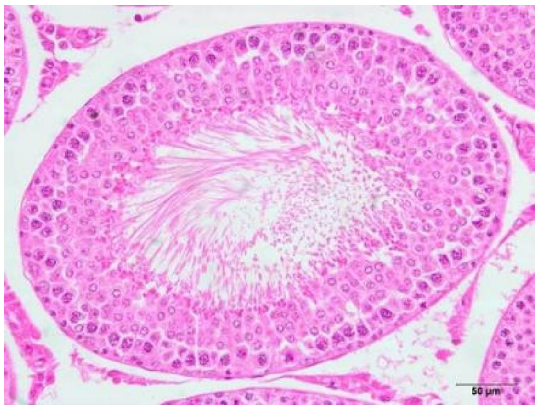

Figure 15. A photomicrograph of a section in the testis of a control rat (group1) showing normal seminiferous tubules. Primary spermatocytes (Ps) appear with the large rounded nuclei. Spermatids (Sp) are small rounded cells with rounded nuclei. Sertoli cells (arrows) are seen between spermatogenic cells (G). Sperms (S) are seen in the lumina of the tubules. Clusters of interstitial cells of Leydig (*) with acidophilic cytoplasm are seen in the interstitial space. (H & E × 400)

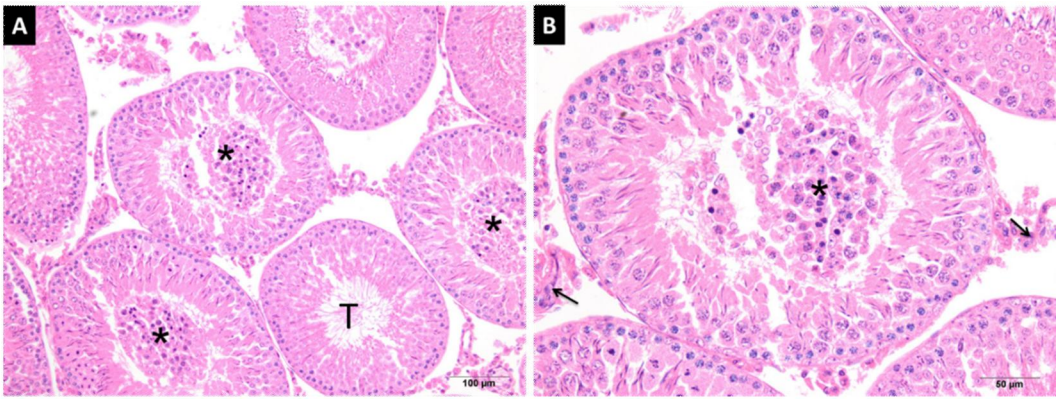

Figure 16. A Photomicrograph of a section in the testis of a fenitrothion treated rat (group 2) demonstrating seminiferous tubules. The lumina of some seminiferous tubules are filled with degenerated sloughed germ cells (*). The degenerated germ cells show darkly stained nuclei. Interstitial spaces contain degenerated Leydig cells with darkly stained nuclei (arrows). Some tubules (T) have apparent diminished layers of germinal epithelium. (H & E: A: × 200, B: x400).

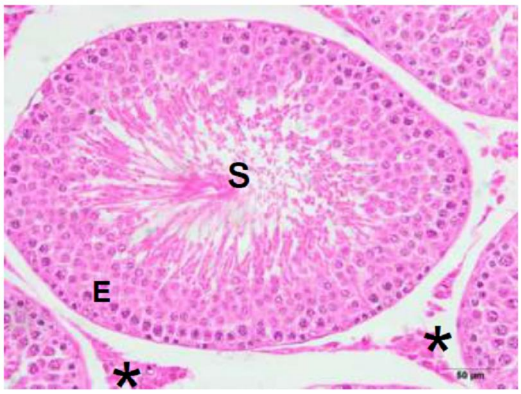

Figure 17. A photomicrograph of a section in the testis of a fish oil treated rat (group 3) showing normal seminiferous tubules and lined by stratified germinal epithelium (E). Aggregations of sperms (S) are seen in the lumen. Interstitial spaces (*) show clusters of Leydig cells. (H & E × 400)

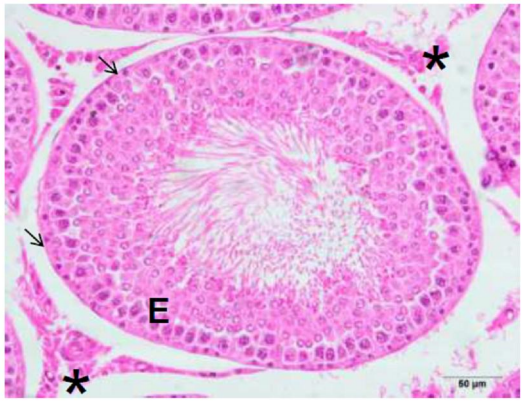

Figure 18. A photomicrograph of a section in the testis of evening primrose oil treated rat (group 4) showing nearly normal seminiferous tubules ensheathed with basal lamina (arrow) and lined by stratified germinal epithelium (E). Narrow interstitial spaces (*) show clusters of cells. (H & E × 400)

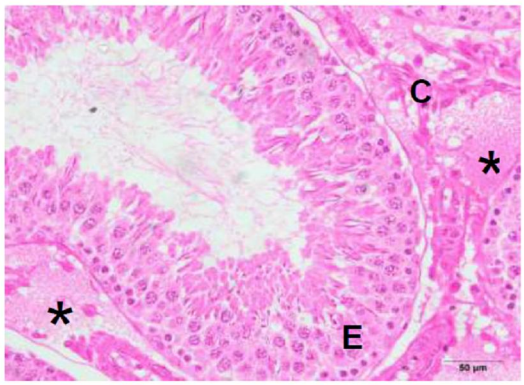

Figure 19. A photomicrograph of section in the testis of a rat co-treated with fish oil plus fenitrothion (group 5) showing a seminiferous tubule lined by stratified germinal epithelium (E). The interstitial spaces (*) are relatively wide, edematous and contain clusters of Leydig cells (C). (H & E × 400)

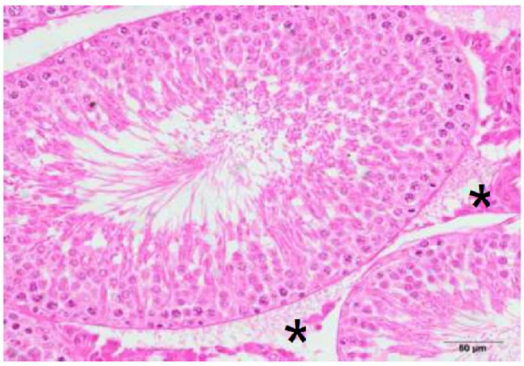

Figure 20. A photomicrograph of section in the testis of a rat co-treated with evening primrose oil plus fenitrothion (group 6) showing nearly normal seminiferous tubules. However, slight edema in the interstitial tissue (*) is also noted. (H & E × 400)

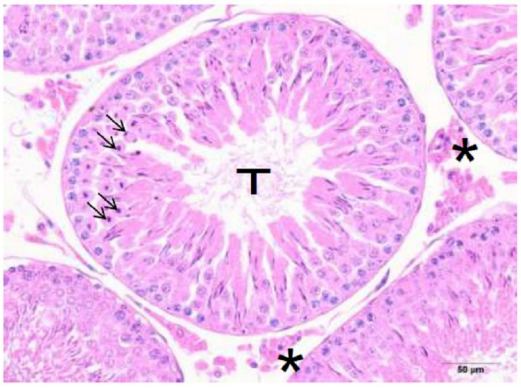

Figure 21. A photomicrograph of a section in the testis of a rat co-treated with fenitrothion and fish oil and evening primrose oil (group 7) showing normal histological structure of seminiferous tubule (T) and interstitial tissue (*). Multiple mitotic figures are seen in the spermatogenic cells (arrows). (H & E × 400)

Histological sections in the testis of control rats (group1) displayed normal seminiferous tubules. Primary spermatocytes appeared with the large rounded nuclei. Spermatids were small rounded cells with rounded nuclei. Sertoli cells were seen between spermatogenic cells, and sperms were seen in the lumina of the tubules. Clusters of interstitial cells of Leydig with acidophilic cytoplasm were seen in the interstitial space (Figure 15). Nevertheless, the testis of fenitrothion treated rats (group 2) demonstrated the lumina of some seminiferous tubules were filled with degenerated sloughed germ cells. The degenerated germ cells showed darkly stained nuclei. Interstitial spaces contained degenerated Leydig cells with darkly stained nuclei. Some tubules had apparent diminished layers of germinal epithelium (Figure 16 A,B). However, sections in the testis of fish oil treated rats (group 3) showed normal seminiferous tubules and lined by stratified germinal epithelium. Aggregations of sperms were seen in the lumen. Interstitial spaces showed clusters of Leydig cells (Figure 17). Sections in the testis of primrose oil treated rats (group 4) showed nearly normal seminiferous tubules ensheathed with basal lamina and lined by stratified germinal epithelium. Narrow interstitial spaces showed clusters of cells (Figure 18). In addition, the testis tissue of rats co-treated by fenitrothion and fish oil (group 5) displayed seminiferous tubules lined by stratified germinal epithelium. The interstitial spaces were relatively wide, edematous and contained clusters of Leydig cells (Figure 19). Also, the testis of rats co-treated with fenitrothion and evening primrose oil (group 6) showed nearly normal seminiferous tubules. However, slight edema in the interstitial tissue was also noted (Figure 20). However, the testis of rats co-treated with fenitrothion and fish oil

evening primrose oil (group 7) showed normal histological structure of seminiferous tubules and interstitial tissue. Multiple mitotic figures were seen in the spermatogenic cells (Figure 21).

4. Dissuasion

Our results revealed that the liver of rats which received fenitrothion showed multiple areas of focal necrosis and disorganized hepatic cords. Necrotic hepatocytes have darkly acidophilic cytoplasm and pyknotic nuclei. Inflammatory Cellular infiltrations were located between the hepatocytes. These findings were supported by the results of (Hayes and Laws, 1991; Afshar *et al.,* 2008a; Elhalwagy *et al.,* 2008; Budin *et al.,* 2012). While the findings of Abdel-Ghany *et al.* (2016) and Tahoun *et al.* (2018) augmented our results in addition to hepatic cells apoptosis. Tahoun *et al.* (2018) exhibits the mobbing of vessels of a portal, recent formation of the bile duct and the hydropic deterioration of hepatocyte. Furthermore, the large regions of coagulative necrosis permeated with lymphocytes in the portal region while the addition of green tea improve the portal tissue alterations. After entering through the oral administration, fenitrothion (FNT) has a capability to get extensively and rapidly absorbed through the intestinal tract if mammals, from where it gets distributed to the blood, carcass, and liver (Afshar *et al*., 2008a). Moreover, the toxicity caused by organophosphorus insecticides outcomes the negative influence on a diverse amount of systems and organs in the mammalian body such as nervous system, kidney, liver, reproductive system and immune system (Elzoghby *et al.,* 2014).

The liver of a rat that received Fish oil with Fenitrothion showed dilated and congested blood sinusoids while the hepatocytes appear not affected with normal appearance while Administration of Evening primrose oil with Fenitrothion showed no histopathological changes in the hepatic architecture although few inflammatory cells were persist around the hepatocytes with prominent Kupffer cells. These results were explained by many authors who used the medicinal or herbal plants to reduce the adverse effect of organophosorus compounds or environmental hazards on the tissues and organs as (Al-Attar, 2015; Baiomy *et al.,* 2015; Soliman *et al.,* 2015; Attia *et al.,* 2013).

Our results revealed that the kidney of rats which received fenitrothion showed dilated and congested glomerular capillary loops and vacuolization of tubular epithelial cells. Homogenous eosinophilic casts are seen in some tubules. Dilated and congested blood vessels and interstitial hemorrhages. These findings were similar to the results of many authors who were working on the renal tissues (Hayes and Laws, 1991; Afshar *et al.,* 2008b; Elhalwagy *et al.,* 2008; Budin *et al.,* 2012; Mansour and Mossa, 2010). While Abdel-Ghany *et al.* (2016) showed minute variation in tubules of renal besides glomeruli at the cortical site and finale at the adverse worsening condition of kidney tissues. Weakening and necrosis of glomerular cluster, interstitial tissue edema and renal tubules cloudy swelling with the hyaline cast. It is noted that as the exposure of fenitrothion duration increases deterioration in the renal tubules is been observed by Tahoun *et al.* (2018) when fenitrothion exposed group.

In malathion ingestion the renal tissues showed severe histopathological damages as mentioned by Mamun *et al.* (2015), and Baiomy *et al.* (2015) and also by cypermetherine ingestion as mentioned by Soliman *et al.,* (2015). The kidney of a rat received fish oil and evening primrose oil with fenitrothion showed showing normal pattern of renal architecture. However, patchy tubular dilatation was apparent and slight glomerular congestion. These improvements were related to the anti-inflammatory effect of fish oil (Grotto *et al*., 2011; Hussein *et al.,* 2013). A number of investigations have demonstrated that diet supplemented with fish oil (FO) enriched in O-3 fatty acids has profound beneficial health effects against various pathologies (Simopoulos, 1991) including cardiovascular diseases, respiratory diseases, diabetes, depression, cancers, inflammatory and immune renal disorders (Thakkar *et al.,* 2000). Reports showed that fish oil prevents gentamicin and cyclosporine A-induced nephrotoxicity (Priyamvada *et al.,* 2008). Fish oil is rich source of the essential fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Compared to saturated fats, poly unsaturated fatty acids (PUFAs) are more readily used for energy when initially ingested. Increasing the degree of unsaturation at a given carbon chain length increases the relative mobility of stored fat, making PUFAs more bioavailable (Storlien *et al.,* 2000).

The lumina of some seminiferous tubules are filled with degenerated sloughed germ cells of rats received fenitrothion. While the interstitial cells (Leydig) showed degeneration with darkly stained basophilic nuclei. Numerous edemas were spread between the seminiferous tubules. These results were supported by the findings of Al-Attar (2015) and Al-Attar *et al.* (2017). The accumulation of Leydig cells in the interstitial space between the seminiferous tubules were characteristic feature fenitrothion intake as mentioned in our work and of Taib *et al.* (2013) and Saber *et al.* (2016).

The addition of fish oil and evening primrose oil with fenitrothion promote improvement in the temporary hazard occur to the testicular tissue. These suggestions were discussed by Taib *et al.* (2014) who

said the use of cancer prevention agents may diminish spermatozoic impacts initiated by organophosphate. Their outcome demonstrated the impacts of palm oil tocotrienol-rich division (TRF) in diminishing the hindering impacts happening in spermatozoa of FNT-treated rats. Supplementation with TRF lessened the unfavorable impacts of FNT by altogether expanding the sperm calculations, motility, and suitability and diminished the strange sperm morphology. TRF fundamentally weakened the DNA harm in the sperm of FNT-treated rats. TRF demonstrated the possibility to decrease the inconvenient impacts happening in spermatozoa of FNT-treated rats. Also, the same suggestion was examined by El-Kirdasy *et al.* (2014) who examined the ameliorative action of N-Acetylcysteine (NAC) against Titanium Dioxide (TiO2) induced testicular degeneration in albino rats. The N-Acetylcysteine (NAC) made valuable improvement as Fish oil and Evening primrose oil. Also, grape seed extract made very good alterations in the degenerative work of organophosphorus compounds that include cadmium or any other heavy metals (Al-Attar, 2015); Alkhedaide *et al.,* 2016).

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3/30/2020