
SUMMARY

This work is important due to the use of pesticide as well as the use of any potentially injurious chemical substance must be taking into consideration the balance of the benefits that may be expected versus the possible risk of injury to human health or degeneration of environmental quality. The previous issue may be explore an help in establishing the no observed adverse effect levels (NOAE) and the application of a safety factors, there by arriving at an acceptable daily intake (ADI). For genotoxic or carcinogens it is possible to assess the risk at the level at the estimated exposure. On the other hand, the (ADI) approach, which is used for non carcinogens, chemicals, and certain non genotoxic, carcinogens, is intended to estimate a dose that is considered safe in light of the available.

1. Acute medium lethal dose LD₅₀ toxicity:-

This study was undertaken to investigate the acute oral administration toxicity of lambda-cyhalothrin, profenofos and chlorpyrifos to adult white mice, the mortality data recorded after 24 hours, the extracted acute LD₅₀ value found to be 95 mg/kg 358 mg/kg and 150 mg/kg for respectively. The results revealed that, the three of tested pesticides could be considering as a highly toxic compound according to the classification of the chemical toxic. Meanwhile, Lambda-cyhalothrin is considered highly toxic when compare with profenofos and chlorpyrifos are considered slightly toxic.

2. Cytogenic alternation and tumors induction (chromosomal aberrations).

The genotoxic effect of tested pesticides is highly equivocal. In contrast, the results observed that tested pesticides caused a significant increased the number of structural chromosome aberration of the metaphase plates of the samples treated for

.....

the highest two concentrations treatment of 1/10 and 1/40 LD₅₀ of all tested pesticides for 24 h.. Neither the acceptable daily intake (ADI) doses nor could induce any significant effect. The data revealed satellite associations, the most frequent structural aberration of the chromatid type was the “chromatid gap and breaks” while the” chromosome ring” was the most the chromosome type aberration and also the predominant aberration in the all aberrant cells, and the percentage of the cells have one aberration were more than cells have more than one aberration compared with the control group. No numerical aberrations (polyploidy) were found in the experiment except the high dose of the chlorpyrifos.

3. Micronucleus test of polychromatic erythrocytes on bon marrow cells.

Statistical analysis of these results revealed that chlorpyrifos highly significant increased the frequencies of (PCEM) at 1/10 and 1/40 LD₅₀ doses comparing with the control and other tested pesticides, but lambda-cyhalothrin is the lowest one, we can concluded that all tested pesticides induce significant increase in micronuclei, given an evidence that tested pesticides as clastogenic effect.

4. Reproductive toxicity (sperm fertility, measures and abnormalities)

It is evident from the present study that the treatment of male mice with tested pesticides resulted in profound altered various morphology sperm abnormalities. The most common types of abnormalities were amorphous, hookless and big head. profenofos as well as chlorpyrifos caused an increase in abnormal sperm heads and tails not only at all doses level used, but also at different time interval, lambda-cyhalothrin, caused the same previous changes but less than profenofos and chlorpyrifos. The present study evidence that the percentages of increase teratospermic (abnormal sperm morphology) associations between

.....
exposure tested pesticides and sperm shape abnormalities, as well as dose–response relationships between exposure and a decline in epididymal sperm count and motility and increased abnormal sperm.

5. Reproductive toxicity (primary spermatocytes)

The results obtained from the analysis of diakinesis stage in mice primary spermatocytes after treatment with tested pesticides revealed that, three different types of aberration were observed they are stickiness, exchanges, and univalent. Cytological examination proved that in the control group binucleat and multinuclei were not observed. The data revealed that significant decreased of fertility after administration of all tested pesticides either in high 1/10 LD₅₀ or low dose 1/40 LD₅₀ within the three post treatment period 30, 60 and 90 days respectively. In the similar effect between high dose 1/10 LD₅₀ and low dose 1/40 LD₅₀, while with (ADI) dose the result showed no significant changes with all tested pesticides and all treatment period. Chlorpyrifos was proven to induce different types of aberration in mice germinal cells more than lambda-cyhalothrin, and profenofos

6. Histopathological study to investigate capability of pesticides to induce cancer or malignant tumors in tissues

Examination of liver sections of these cases revealed cytotoxic and excessive hepatocellular damage to liver parenchyma in the form vascular congestion, hydrophic degeneration and leukocyte infiltration in the affected organs at the initial stages. At the terminal stage of toxics, coagulative necrosis, aggregation, edema, and the hepatic cells showed polymorphism in its shape and size and the nucleus were enlarged with typical or a typical mitotic activities (hepatic carcinoid tumors). Pathological finding in kidney showed perivascular edema with congestion of renal blood vessels, infiltration of mononuclear cells and around

.....

some of glomerular tubules. Pathological finding in spleen showed disorganization of lymphocytes in lymphoid follicles and in white pulp, depletion of lymphocytes with sub capsular edema, and other cases showed increasing the number of megaterocytes with hemorrhages and haemosiderosis. Pathological finding in Brain showed menengial hemorrhages and congestion of blood vessels, with neuronophagia and satelletosis and sub meningial encephalomalacia, with neuronal degeneration of purkinjie cells were noticed and lesions. The degree of changes was found to be dose dependent.

7. Molecular analysis to investigate the protein profile:-

In the present study it was clear that both insecticides were altered the pattern of the protein profile in brain and liver as well. Both insecticides produced dramatic quantitative and qualitative alternation in proteins of liver, kidney, brain and tests (e.g. decrease the bands quality, increase bands quality, missing of bands and appearance of new bands).

8. Effect of pesticides on acetylcholinesterase activity (AChE).

The data demonstrate the high significant decreased of specific activity in liver (AChE) after administration of all tested pesticides either in hight 1/10 LD₅₀ or low dose 1/40 LD₅₀ within the three post treatment period 30, 60 and 90 days respectively, , while with (ADI) dose the result showed no significant changes with all tested pesticides and all treatment period. Plasma (AChE) activity data revealed that similar observation has been found with liver free (AChE). The inhabited of (AChE) activity was evident in liver and plasma at all diferent level of all tested pesticides and period, while in brain the activity was high significant increased of specific activity after administration of all tested pesticides either in hight 1/10

.....
LD₅₀ or low dose 1/40 LD₅₀ within the three post treatment period 30, 60 and 90 days respectively.

9. Effect of pesticides on mono amine oxidase activity (MAO).

The result showed high significant decreased of enzyme activity at 90 days period more than 60 days period when compared to the level of activity after 30 days and control. The activity of liver (MAO) activity was severely decreased at the level of 1/10 LD₅₀ value after treatment with lambda-cyhalothrin at 90 days more than the other pesticides and dose. Slightly decreased of (MAO) activity has been found with profenofos at dose (ADI). While, the data of brain (MAO) activity demonstrate the high significant increased of specific activity in (MAO) after administration of all tested pesticides either in high 1/10 LD₅₀ or low dose 1/40 LD₅₀ within the three post treatment period 30, 60 and 90 days respectively. Plasma (MAO) activity data revealed that similar observation has been found with liver (MAO).

10. Effect of pesticides on adenosine triphosphate activity (ATP-ase).

The activity of liver (ATP-ase) activity was severely decreased at the level of 1/10 LD₅₀ value after treatment with chlorpyrifos at 90 days more than the other pesticides and dose. Slightly decreased of (ATP-ase) activity has been found with profenofos at dose (ADI). The result showed high significant decreased of enzyme activity at 90 days period more than 60 days period when compared to the level of activity after 30 days and control. Brain and plasma (ATP-ase) data revealed that similar observation has been found with liver (ATP-ase). The inhibition of (ATP-ase) activity was evident in liver, brain and plasma at all different level of all tested pesticides and period.

.....

11. Effect of pesticides on reduces glutathione (GSH) content.

The data of liver (GSH) level demonstrate the high significant decreased of specific activity in liver (GSH) level after administration of all tested pesticides either in high 1/10 LD₅₀ or low dose 1/40 LD₅₀ within the three post treatment period (30, 60 and 90 days) respectively. The result showed high significant decreased of enzyme activity at 90 days period more than 60 days period when compared to the level of activity after 30 days and control. Brain and plasma (GSH) level, data revealed that similar observation has been found with liver and brain (GSH) level, the decreased was proportional to time and dose recording.

12. Effect of pesticides on glutathione -S- transferase activity (GST).

The data of liver (GST) activity demonstrate the high significant increased of specific activity in liver (GST) after administration of all tested pesticides either in high 1/10 LD₅₀ or low dose 1/40 LD₅₀ within the three post treatment period 30, 60 and 90 days respectively. The data of brain (GSH) level demonstrate that high significant increased of specific activity in brain (GSH) level after administration of lambda-cyhalothrin either in high 1/10 LD₅₀ or low dose 1/40 LD₅₀ within the three post treatment period 30, 60 and 90 days respectively. While, profenofos caused high significant decrease in brain (GSH) level with all treatment period and dose recording. On the other hand the result showed no different changes with chlorpyrifos. Plasma (GSH) level, data revealed that similar observation has been found with brain (GSH) the decreased was proportional to time and dose recording.

13. Effect of pesticides on glucose -6- phosphate dehydrogenase activity.

The result showed high significant decreased of enzyme activity at 90 days period more than 60 days period when compared to the level of activity after 30 days

and control. The activity of liver (G6P-DH) activity was severaly decreased at the level of 1/10 LD₅₀ value after treatment with lambdacyhalothrin at 90 days more than the other pesticides and dose. Slightly decreased of activity (G6P-DH) has been found with profenofos at dose (ADI). Brain (G6P-DH), data revealed that similar observation has been found with liver activity (G6P-DH). Meanwhile in liver the higly decreased at the level of 1/10 LD₅₀ value after treatment with lambdacyhalothrin at 90 days more than the other pesticides and dose. Slightly decreased of activity (G6P-DH) has been found with chlorpyrifos at dose (ADI). Plasma (G6P-DH), data revealed that similar observation has been found with liver and brain activity (G6P-DH). Meanwhile in plasma the higly decreased at the level of 1/10 LD₅₀ value after treatment with chlorpyrifos at 90 days more than the other pesticides and dose.