The Effect of Endosulfan Insecticide On Blood Parameters in Rat

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Abstract

Endosulfan an insecticide has not vast usage in controlling of insects. This poison is assailable on human and animals via food, aspiration and skin. In this research, checked the long-range effect of Endosulfan EC 35\% on blood factors in rat. So 40 rat divided to 5 groups. The control group, the placebo group receipted saline 9\% and 3 experimental groups receipted 5 , 10 and 20 mg/kg for 21 days via gavages Endosulfan EC 35\%. On the end of experiments the rats wants into comatose via chloroform, phlebotomy of heart done and blood factors evaluated with laboratory standard methods. Statistics analyze shows that the scale of WBC, monocyte, has got increase (P<0.05) and RBC, lymphocyte, Platelet, has got decrease (P<0.05) toward Control group. Endosulfan on long-range has got important effects on blood factors that can causes of serious hurts and even anemia and correlate malady, in addition the effect ions of chemical poisons depends on dose and tangent time, so increase of using Organochlorea slump-dais in homes and farms for destroying Jassids is dangerous for health of humans and animals.

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1. Introduction:

Humans for restrain of destroying their outturns that gets with longtime, cost and toil and because of
population growth and the limits of manufacturing food production, use of several methods for controlling Jassids that among of these methods, using of Jassid destroy poison is the commonest method. (Legaspi JA, 2002). The definition that exhibited via USA environment protection agent about slump-dais is “slump-dais is a res or mixture of material that use for destroy, prevention, exterminate or decrease of any Jasside. The checking shows that just in USA, in each year up to 2,000,000,000 dollars use for slump-dais several parts like agriculture and in the jungles. (Federal Insecticide, 2003)

For the reason of high usage, affront of people with these poisons has got increase and so the result of its bad effects on human’s health will be grown. For example, “Public Health Society” of USA estimates that about 1.275,000 American farmer have affront with several slump-dais. It is important to know in some poor countries compare with advanced countries, because of high usage and be available anywhere the sickness of these poisons is very high. For example in China estimated that sickness with slump-dais that usually of kind of Organochlorea and organophosphate is the cause of about 175,000 people death in each year. So because of high usage of these poisons, affront of people with poisons is unavoidable and it can be in the environment extraneous and involuntary. According to studies that before done, the unit of occurrence sickness in advanced countries is thirteen fold more than industrial countries, also poor countries use 85% of world manufacturing of these poisons. The physical and chemical attribute of organic poisons and their metabolites, causes that this mixtures go into the people and animal’s body easily. High solventness in fat and low solventness in water is causes to aggregation in adipose tissue. The quantity of aggregation on peoples and animals on type, time and contact density is different in environment conditions. This aggregation shows that these poisons can have effect ions on far area from spotty area. The speed of these biological and chemical mixtures is very low and they attract by soil very easily. Alive creature can attract these materials via food and environment. According to high usage of Endosulfan poison via farmers and for use of this poison on outturn, seems that this poison is the cause of physiologic changes on different part of body like blood cells. With spot of lateral affection and high poison grade of Endosulfan poison, the aim of this research is the affection of this poison on blood cells of rat

2. Materials and Methods

Statistics and dividing in this research, defined below: samples divided in 5 groups that each group contains 8 mice, control, placebo and 3 experimental groups. For this research 40 rat (about 2 month ago and 180-200 mg weight) have divided on 5 groups:

- Control group: nothing receipted.
- Placebo group: just eaten 9% saline product
- Group 1: 5 mg/kg body weight Endosulfan
- Group 2: 10 mg/kg body weight Endosulfan
- Group 3: 20 mg/kg body weight Endosulfan

Samples kept in 17 -25 (temperature) and natural-light conditions and free access to water and food during 2 weeks for consistency with environment, also these conditions done during the experiment.

The method of feeding via Gastro-Intestinal tract for attendance group chose the method of Oral gavage. The advantage of this method is quick-suction of infusions material, so injection absorbs for a short time and went into circulatory tract and influenced on inner organs.

As the affect system of this poison is via digestion and contacting, so chosen the method of feeding via gastro-intestinal tract. First rats weighted carefully and after calculate, specify the quantity of edible Endosulfan. For phlebotomy, stupefy rat on special glassy beaker desiccators with chloroform and after that put the rat to sleep on its back via fingertip specify the heart place, and phlebotomy done via 5cc and 10cc syringe directly from heart of rat.
The derivative blood strewed on micro tube that smears to “EDTA” and after transport lab, blood facts, WBC, RBC and platelets measured by SYS-MEX machine and specify the quantity of each blood facts. After specify the quantity of each blood facts, checked affect amount of Endosulfan poison on experiment and controls group of statistics.

3. Results and Discussion

3.1. Affect on the amount of red blood cells:

Checking the average of RBC on control group and tentative groups and it’s comparison on surface of (P< 0.05) specify that, among the average of 10 and 20 mg/kg Endosulfan with control-group is significant decrease, but among the 5 mg/kg Endosulfan and placebo group with control group there is no any difference.

Fig. 1: Checking result of RBC count shows that there is a significant decrease in experimental group 2 and 3.

* Significant , (P < 0.05)

3.2. Affect on the amount of hemoglobin (Hb):

Checking the average of “Hb” amount on control group and tentative groups and comparison surface (P< 0.05) specify that among the average of third tentative group (attendance with tentative dose 20mg/kg Endosulfan poison) and control group, there is a significant decrease, but there is on any difference among other tentative groups and placebo group with control group.
Fig 2: Checking result of Hb’s amount shows that, there is a significant decrease in experimental group 3.
* Significant, (p < 0.05)

3.3. Affect on the amount of white blood cells:

Checking the average of WBC amount on control group and average of third tentative group (attendance with tentative dose 20 mg/kg Endosulfan poison) and control group, there is a significant increase, but among the other tentative groups and placebo group with control group, there is no any difference.

Fig 3: Checking result of WBC count shows that there is a significant increase in experimental group 3. *Significant, (p < 0.05)

3.4. Affect on lymphocytes:

Checking the average of lymphocytes percent on control group and tentative groups and it’s comparison in surface (P< 0.05) specify that among the average of third tentative group (attendance with tentative dose 20 mg/kg Endosulfan poison) and control group, there is a significant decrease, but among other tentative groups and placebo group with control group, there is no any significant difference.

3.5. Affect on Monocytes:

Checking the average of Monocytes percent on control group and tentative groups and it’s comparison in surface (P< 0.05) specify that among the average of third tentative group (attendance with tentative dose 20 mg/kg Endosulfan poison) and second tentative group (attendance with tentative dose 10 mg/kg Endosulfan poison) with control group, there is a significant increase, but among first tentative group (attendance with tentative dose 5 mg/kg Endosulfan poison) and placebo group with control group, there is no any significant difference.
3.6. **Affect on Eosinophils and Neutrophils:**

Endosulfan poison is feckless on the average of Eosinophils and Neutrophils and there are no any significant differences on them.

3.7. **Affect on platelets (PLT)**

The average of PLT’s amount on control group and tentative groups and it’s comparison in surface (P < 0.05) specify that among the average of first tentative groups (attendance with tentative dose 5 mg/kg Endosulfan poison) and third tentative groups (attendance with tentative dose 20 mg/kg Endosulfan poison) and control group, there is a significant decrease. As shows on Figures 1 and 2, the average of RBC amount in second tentative group (attendance with tentative dose 10 mg/kg Endosulfan poison) and the third tentative group (attendance with tentative dose 20 mg/kg Endosulfan poison) and hemoglobin’s amount on third group, is less than control group and the average’s difference of statistics is significant.

The reasons of RBC decrease are:

1) Endosulfan affection RBC and it is the cause of making these cells slippery. Insecticides can harm to membrane of red blood cell and finally destroy them.

2) Disorders of the RBC membrane via poison effect, causes transfiguration and trap of RBC in lien.

3) Changing oxidative on enzymes RBC that causes RBC toward oxidant substance be vulnerable and have less longevity.

4) Decrease of blood hemoglobin with decrease of RBC, maybe it is the cause of slump-dais’s effect on blood maker’s organs in rats. Several levels in Heme biosynthesis by rest of slump-dais restrain that this be probably a physiologic cause and a important cause for results, the researches shows that hematology Organochlorea slump-dais and blood chemistry change the environment’s of lab’s animal and their wild life.

Also it is prove that insecticide’s material and her biocides’ material in agriculture and the causes of hemoglobin’s harm and effective decrease on Erythrocyte’s amount.

On former researches slump-dais’s effect on blood hemoglobin in several work men checked that is the same result by this research. Reading that done by Jyotsna in the year of 2003 shows that being disposable of slump-dais can cause of intervention on biosynthesis hemoglobin and can causes of shorten erythrocyte’s longevity. As showed on figure 3, the average of WBC amount in experiment and tentative groups 1, 2, 3 is more than control group but the differences in averages in phase of statistics just in third tentative group (attendance with tentative dose 20 mg/kg Endosulfan poison) with control group is sensible, means with increase of poison’s dose, the average of WBC amount will be more and more and in third group with control group has got a sensible increase.

The causes of WBC increase can be reason of bad effect of Endosulfan on stem cells and multi-tasks cells that is the reason of their activities’ increase. Former studies are a reason for that Organochlorea’s compositions can decrease these parameters. Result shows that the average of lymphocyte’s quantity in third group (attendance with tentative dose 20 mg/kg Endosulfan poison) is less than control group.

Difference of average about statistics is sensible while the average of lymphocyte’s quantity on other groups toward control group did not show a significant difference.
The reason of lymphocyte’s decrease on third group is:
- Harmful effects of Endosulfan poison on Lymph Nodes and Thymus gland.
- Endosulfan poison cause represses of body safety system and finally cause Lymphocyte’s decrease. Reading of Susan and team-mate on the year 1999 prove that Endosulfan cause safety system stay and intervention on protection by antibody.

The results of this research showed accost with Endosulfan poison with 10, 5 and 20 doses with each kilogram during 21 days by gavages showed the amount of WBC, Monocytes has sensible increase (P<0.05) and RBC, Lymphocytes, platelets, has sensible decrease (p < 0.05) toward control group.

The affect of Endosulfan poison depend on its dose and time of contact and with increase of its dose, increase its bad effects.

References