Original Research Paper

Volume - 10 | Issue - 7 | July - 2020 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Environmental Science

IMPACT OF ORGANOPHOSPHATE PESTICIDES ON SUGAR IN URINE OF OCCUPATIONAL WORKERS AT BIJNOR DISTRICT OF U.P (INDIA).

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ABSTRACT Occupational practice in farming sector at bijnor is based on chemical. Here farmers focus on crops which beneficial to economic growth. Hence they use over fertilizers as well as insecticides for high yield of crops. There are different combination of pesticides are used for better management of pest in farming system. Present study is based on the effects of organophosphate pesticides on farmers and occupational workers of Bijnor District Uttar Pradesh .In this study selected parameters of urine are considered like sugar, albumin and occult blood. During study sugar parameter specially in urine of workers are selected because it is a common problem in the area. Our findings indicate that various health related other issues are found in workers. Results of the urine examination study show that the certain pesticides cause noticeable changes in urine of workers, specially related to sugar, albumin and occult blood.

KEYWORDS : organophosphate Pesticides, Sugar, Albumin, Occult blood.

INTRODUCTION

These days our agriculture system is completely depends on chemicals and fertilizers. The fertility of soil in area spontaneously decreased by the excess interference of human for high production. This situation come due to the high demand of agricultural product in market. Basically high demand of agro-product based on the large number of population in our country.

Farmers use micro and macro nutrient for well survival of their plants. Here they use Chemicals to protect their crops from pest. Due to the lack of toxic knowledge works apply combine form of various pesticides for short time action and they rarely protect themselves from the chemicals. These Chemicals enter inside the workers body by various route and cause dramatic change in the physiological process. On the contrary, in recent years, some scientists have proposed that these chemicals are disrupting the wild life. The biocides agriculture, chemicals collectively known as "pesticides", without any doubt, is largest group of poisonous substances that are widely broadcast today.

Pesticides may be defined as a substance or mixture of substances intending for providing, destroying, repelling or mitigating any pest. These chemicals were so successful in controlling pests that there was an extremely rapid and general adaptation of them, and development of new ones has been very fast. With the introduction of pesticides, agricultural practices have undergone revolutionary changes leading the incredible possibility that hunger can be banished from earth. Better agricultural techniques have contributed, in varying ways, to the general uplift of mankind.

These chemicals also used on Sugar Cane, Barley Beans, blueberries, broccoli sprouts, cabbage, carrot, cauliflower, celery, clove, corn, cucumber, Spinach, sweet potato, wheat, fruits and Nut trees (orchard crops) including apples, apricots, almonds, cherries, peach pear, plum, prunes and walnuts. It is also used for ornamental trees and shrubs, including shade trees, citrus (nonbearing) shrubs, nursery stock and woody plants. It is used as cultivation root tip, cherry, peaches and plum roots and crowns and whole strawberry plants. Moreover, it is widely used for agriculture in green houses (tomatoes and ornamental trees and shrubs).

Formulation use by local farmers as they mix up chlorinated and organophosphate type of pesticide and then use to kill the pest. In local market Various brands of pesticides is available.

Such as Malathion, chlorpyriphos Nuoan, endosulfan, Mevinphos, Monocrotophos etc.

Present study focus on the use of organophosphate pesticide Malathion and other . Malathion includes emulsified concentrate, retable power, and ultra-low volume liquid and smoke tablets. It is most commonly used on house-hold and leaf eating pests, in the form of spray to kill cockroaches', mosquitoes and house fly etc. Malathion is used in wide area treatment such as public health mosquito control; fruit fly control and boll weevil erode caution programs. Malathion is also used as head lice treatment.

MATERIALAND METHOD:

Organophosphate group of pesticide select for the study .Specially focus on Malathion for the study because in the selected region farm workers mainly use it to control the pests of various crops. It is sold in the trade name cythion or malathion. It is brownish liquid and is widely used for pest control in vegetable and field crops.

Selection of site and Individual :

There are 4 site selected for study purpose.
I. Nagal Road site
II. Barraj Road site
III. Nagina Road site
IV. Chandpur Road. site

Individual of different villages are come under each road site. Individual of age group 25-60 years Male and Female were involved in the study. At each site we collected samples of 50 persons who used the pesticide in their fields. Basically persons are selected from Agriculture field. Parameter of Study is based on the qualitative basis. Sample was collected random basis at each site and analysis in laboratory by standard laboratory method. For study of urine examination we used the laboratory of Krishna college of Science and technology Bijnor U.P.

Estimation of Urine in Occupational Workers:

Present study based on the qualitative test of albumin, glucose and occult blood.

1. Procedure for Albumin test in Urine:

Take 10 ml of urine in a test tube. Hold it over flame in a standing position for 2 minutes. Turbidity occurs, which is due to the presence of phosphate, Carbonate & Albumin. Add 5 ml of 10% Acetic Acid. If the turbidity disappears after acidification, then the turbidity is due to phosphate and carbonate. If turbidity does not disappear it indicates that albumin is present in the urine.

2. Test for Glucose

Take 5 ml of Benedict reagent and add 8 drops of urine. Boil for 1 to 2 minutes. A light green color indicates - .5% glucose. Fellow colour indicates - 1% glucose. Brick red colour indicates - 2% glucose.

3.Test for occult blood

Test for occult blood is done by "Benzedine test".

Method : Take 3 drops of Benzedine solution and add 1 drop of this to 2 ml of urine in a test tube. A blue or green colour indicates the presence of blood.

Standard Deviation: An attempt was made for comprehensive analysis of data collected for this research work. To access the changes and to find out the statistical significance of the result obtained, **'Students 't'** was used.

RESULTS & DISCUSSION:

The first result of the survey was that the most of the states are hiring labour from remote areas i.e. other states. Second, the occupational

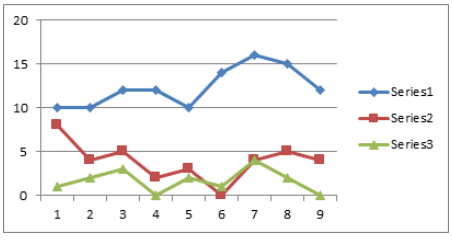
workers are not aware of self-care and precautions as shown in fig 1 and 2. Next, For economic gain farmers release good quality of production in market while they consume poor quality, contaminated with pesticides, themselves. Highest sugar level was reported among the age group of 45-60 year. Findings are similar to D. H. Lee et.al.(2011) "Low dose organochlorine pesticides and polychlorinated biphenyls predict obesity, dyslipidemia, and insulin resistance among people free of diabetes.[03] H. K. Son et.al.(2010) also reported Strong associations between low-dose organochlorine pesticides and type 2 diabetes in Korea.[05] Juntarawijit and Juntarawijit (2018) noticed that Association between diabetes and pesticides: a case-control study among Thai farmers. [06] In agricultural health issues indicate by Starling AP et.al.(2014) Pesticide use and incident diabetes among wives of farmers in the agricultural health study.[13]

The finding of glucose, albumin and occult blood in occupational workers related to the dysfunction of liver and kidney of individual. Similar findings reported by Benjamin N et.al.(2006) Histopathological changes in liver, kidney and muscles of pesticides exposed malnourished and diabetic rats.[01] Sargis RM(2014) findings state that The hijacking of cellular signaling and the diabetes epidemic: mechanisms of environmental disruption of insulin action and glucose homeostasis.[15]

Fig1. farmers use pesticides without any precaution.

Fig.2 .After spray of pesticide they eat meal

As these problems become more widely appreciated, pest control began to rely more on anti-cholinesterase, organophosphorus and carbamate ester pesticides. However, it was not until 1943 that interest in this type of compound became more general. Cases of organophosphate toxicity caused by different pesticides have been reported in large numbers from different parts of the globe. Conservative estimates indicate that about seven hundred and fifty thousand people suffer from pesticide poisoning every year and about fourteen thousands of these prove fatal. These are an estimated three hundred and seventy thousand cases of human poisoning by pesticides in developing countries every year with about ten thousand deaths. Result of the present study is indicated by the graph. Some parameter like sugar in urine found significantly and some like albumin and occult blood are insignificantly found. The above Problem basically produce when pesticide enter in the food chain statement supported by Rezg R et.al. (2010) Organophosphorus pesticides as food chain contaminants and type 2 diabetes.[12]



In graph Series -1 indicate Sugar in Urine , Series 2 indicates Albumin in urine and Series 3 represent the occult blood in urine.

Poisoning of organophosphates cause many disease and symptoms in body i.e. salivation, urination, diarrhea, wheezing, sweating, abdominal cramps and intestinal hyper mortality, Paralysis, Respiratory muscle weakness, Tachycardia, Hypertension and C.N.S. disease, Anxiety, Restlessness, Confusion, Headache slurred speech, Ataxia, Coma and Central respiratory paralysis. Organophosphates form irreversible bond with enzyme cholinesterase.
Our findings are similar to other researchers such as:

March *et al.* (1956) sprayed calves with 5% Malathion twice at weekly interval. The calves were sacrificed after one and two weeks the of last application. The concentration of Malathion in different tissues (forelegs, shoulder, tail, tongue, thymus; thyroid, kidney and hide) was about 0.11 ppm except in the case of liver and bone which had concentration about 1.20 and 1 to 2 ppm respectively. [07] O'Brain (1956) while investigating the probable mechanism of Malathion toxicity in albino rats and its isomer (isoMalathion) inhibited rat liver succinate dehydrogenase activity, but in insects, it was insensitive. [11] Murphy and Dubois (1957) demonstrated that single dose of EPN in concentrations below capacity of rat livers detoxify malaoxon.[08] Murphy and Dubois (1957) and Cook (1958). It appeared that any compound which selectively inhibited carboxyesterase might potentiate Malathion.[02,09]

Milby (1964) tested the skin sensitising potential of 95% pure, analytical standard grade melathion in ethanol, at in 7 human volunteers. [10] Thatoo and Prasad (1989) observed that in Lamblood glucose level was increase (Hyperglycemia) due to Malathion toxicity. [16] Wa *et al.* (1989) reported occupational risk of decreased plasma cholinesterase among pesticide production workers in Taiwan. [17] Fortunato *et al.* (2006) reported that oxidative stress induced by Malathion in rat Brain.[04] Sharma et al (2005) reported that subchronic exposure of Dimethoate induced effects on antioxidant status of liver and brain of rats.[14]

CONCLUSION:

Based on the complete study, it is suggested that since the pesticides are indispensible in the modern world to feed the rapidly exploding population proper precautions should be taken while handling these chemicals. There is an acute requirement of the awareness regarding toxicity of chemicals. Farmers and other individuals involved in agriculture have little k knowledge about the right measures to use pesticides and the harmful results emerged due to the excess use of these.

Acknowledgement:

Authors extend their sincere thanks to The Principal, Krishna College of Science and Technology for providing lab facility and research atmosphere. They are highly grateful to CMO Bijnor for his valuable cooperation by discussing on the issue and giving his helpful opinions related to the issue. The cooperation made by the Forest Department, Bijnor is a must to be considered as the Department helped the research by providing transportation facility whenever required.

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