International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

Green Revolution: A Case of Organochlorine Poisoning - A Case Report

Sabarirajan T.[1], Nithyaraj[2], Kirubasankaran[3]

[1]Second Year Resident, Department of Emergency Medicine, Sri Manakula Vinayagar Medical College and Research Institute, Puducherry, India (Corresponding Author)

[2]Assistant Professor, Department of Emergency Medicine, Sri Manakula Vinayagar Medical College and Research Institute, Puducherry, India

[3]Senior Resident, Department of Emergency Medicine, Sri Manakula Vinayagar Medical College and Research Institute, Puducherry, India

Abstract: ***Background: Organochlorine pesticides are synthetic pesticides widely used, Belong to the group of chlorinated hydrocarbon derivatives. The characteristic of pesticides such as lipophilicity, bioaccumulation, long half – life & potential. Organochlorines were used as control of malaria and typhus, organochlorines insecticides such as DDT, Hexachlorocyclohexane [HCH], aldrin and dieldrin are some of OC compounds. Case Description: A 56 year old male brought to ER at around 7.45 pm with A/H/O consumption of DDT poisoning on 21/06/2023 at around 2pm at his residence. VITALS: PR: 112/min, BP: 160/100 mmhg, SPO2: 83 in RA, 93 on 15 liter O2. Temp: 98.6°. K/C/O T2DM, SHTN, CKD, CAD and OLD PTB sequelae on irregular medication. Patient explained about prognosis and need for intubation and ICU admission. So patient got discharged against medical advice. Around 8.10 pm patient was again brought to ER in unresponsive state, carotid not felt, cardiac monitor shows pulse less electrical activity. As per ACLS protocol CPR Initiated. After 5 cycle of resuscitation, and 3 dose of adrenaline, patient obtained ROSC. Patient was started on multiple inotropes and shifted to ICU for observation. Conclusion: The use of pesticide has not only affected the crop it has also altered the eco system. Pesticide are causes of high morbidity and mortality hence chemical pesticides should be controlled and alternation should be used like, manual removal, applying heat, covering weed with plastic to maintain healthy soil, consumer awareness should brought up among people.***

Keywords: Organochlorines

1. Introduction

Organo chlorine pesticides are synthetic pesticides widely used. Belong to the group of chlorinated hydrocarbon derivatives. Used for destruction of insects, weeds, fungi, bacteria etc. Pesticides have developed for the concept of target organism toxicity, often non – target species are affected badly. The characteristic of pesticides such as lipophilicity, bioaccumulation, long half – life & potential of transport have nature of contaminating the air, water, and soil. Organochlorines were used as control of malaria and typhus, organochloriens insecticides such as DDT, Hexachlorocyclohexane [HCH], aldrin and dieldrin are some of OC compounds.

2. Case Description

A 56 year old male brought to ER at around 7.45 pm with A/H/O consumption of DDT poisoning on 21/06/2023 at around 2pm at his residence.

V/S: PR: 112/min, BP: 160/100 mmhg, SPO2: 83 in RA, 93 on 15 liter O2. Temp: 98.6°. K/C/O T2DM, SHTN, CKD, CAD and OLD PTB sequelae on irregular medication. Patient explained about prognosis and need for intubation and ICU admission. So patient got discharged against medical advice. Around 8.10 pm patient was again brought to ER in unresponsive state, carotid not felt, cardiac monitor shows pulse less electrical activity. As per ACLS protocol CPR Initiated. After 5 cycle of resuscitation, and 3 dose of adrenaline, patient obtained ROSC. Patient was started on multiple inotropes and shifted to ICU for observation.

3. Discussion

Organochlorines (OC) are a group of chlorinated compounds widely used as pesticides. These chemicals belong to the class of persistent organic pollutants (POPs) with high persistence in the environment. OC insecticides were earlier successfully used in control of malaria and typhus, Due to their low cost and the need against various pests, organochlorine insecticides such as DDT, hexachlorocyclohexane (HCH), aldrin and dieldrin are among the most widely used pesticides in developing countries of Asia. Organochlorine toxicity is mainly due to stimulation of the central nervous system. Cyclodines, such as the GABA antagonists endosulphan and lindane, inhibit the calcium ion influx and Ca - and Mg - ATPase causing release of neurotransmittors. Epidemiological studies have exposed the etiological relationship between Parkinson's disease and organochlorine poison. Organochlorines act as endocrine disrupting chemicals (EDCs) by interfering with molecular circuitry and function of the endocrine system. It affects mainly the central nervous system and was found to have higher acute inhalation toxicity than dermal toxicity. Gastrointestinal absorption of DDT is very high. Organochlorine pesticides and or their metabolites can sometimes be identified in blood by gas - liquid chromatographic examination of samples taken within a few days of significant pesticide absorption. Such tests are performed by a limited number of government, university and private laboratories, which can usually be contacted through poison control centers or health departments. Some organochlorine pesticides or their metabolic products (notably DDT, dieldrin, mirex, heptachlor epoxide and

chlordecone) persist in tissues and blood for weeks or months after absorption, but others are likely to be excreted in a few days, Blood levels tend to correlate more with acute toxicity, while levels found in adipose tissue and breast milk, Chromatographic methods make possible detection of most organochlorines toxicity. acute toxicity from lindane involve blood levels of 130 ng/mL or greater, with the most severe and fatal cases involving levels exceeding 500 ng/mL.2 DDT, DDE and a few other organochlorines are still found at very low levels in blood, Measurements of urinary metabolites of some organochlorine pesticides can be useful in monitoring occupational exposures; however, the analytical methods are complex and are not likely to detect amounts of metabolites generated by minimal exposures.

Treatment

Manage convulsions, Administer oxygen, Decontaminate skin, Consider GI decontamination, Monitor cardiac, pulmonary status.

The use of pesticides in order to improve agriculture has not only affected the crop, it has also altered the ecosystem. Pesticides are causes of high morbidity and mortality. Hence the use of chemical pesticides should be controlled and more use of bio - pesticides should be employed. Many alternatives are available to reduce the effects of pesticides on the environment. Alternatives include manual removal, applying heat, covering weeds with plastic, placing traps and lures, removing pest breeding sites, maintaining healthy soils that breed healthy and more resistant plants, cropping native species that are naturally more resistant to native pests and supporting bio - control agents such as birds and other pest predators. Consumer awareness should be brought up among people in concern with the long - term harm caused by pesticides.

Conflicts of Interest: DDT

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