Case Report

Indoxacarb Poisoning, a rare poison presenting as methemoglobinemia: a case report

Nirmala A.C., Associate Professor; Aravind, Assistant Professor; Nithin, Postgraduate; M.S.Bharath, Postgraduate., Department of Medicine, Victoria Hospital, BMCRI, Bangalore, India. Email: dr.nirmala.ac@gmail.com


Key words: Indoxacarb, methemoglobinemia, methylene blue

Abstract
Indoxacarb is an oxidiazine insecticide used in farming developed by DuPont that acts against lepidopteran larvae. Only few cases of poisoning have been reported until now. We report another rare case of Indoxacarb Poisoning which presented with central cyanosis, seizures and altered sensorium which was treated successfully. Importance of this case report lies in the fact that with early recognition, definitive treatment is possible.

Introduction
Poisoning refers to the development of dose-related adverse effects following exposure to chemicals, drugs, or other xenobiotics. In India generally two types of poisoning is seen as agriculture based and with pharmacological agents i.e. drugs. India is an agriculture-based country with over usage of pesticides. In emergency two types of pesticide poisoning is common as with organophosphates and with aluminium phosphide. Nonorganophosphorous poisons like Indoxacarb is becoming common nowadays which is rarely diagnosed and reported because of varied presentation. It is marketed under the names Indoxacarb Technical Insecticide, Avaunt Insecticide and Steward Insecticide.

Case Report:
A 22 year old young lady was brought to our casualty early in the morning with alleged history of consumption of insecticide (14.5% SC Avaunt). She was taken to local hospital where stomach wash was given and then referred to our hospital for further management. Patient had one episode of seizure of GTCS type. On
examination she was drowsy, her blood pressure was 100/70 mmHg, PR-104/min SpO2-87%, RR-24/min, central as well as peripheral cyanosis-present.

While sampling blood for routine investigations it was found that the color was brownish black and the possibility of methemoglobinemia was considered and the patient was shifted to ICU and treated accordingly with Inj.Methylene Blue 120 mg diluted in 100 ml saline (dose 2 mg/kg,) was given over a period of 10 min intravenously and Inj. Vitamin C 500 mg in 5% dextrose was also started[3]. Inj. methylene blue 60 mg (dose 1 mg/kg) and ascorbic acid 500 mg in 5% dextrose were continued at 12-h intervals for 2 days and other supportive measures like noninvasive ventilation was also taken. On investigation, Day one - Hb-10.2 gm%, PCV-33.6 %, Pseudocholinesterase-6182 U/L, Urea-16, Creatinine-0.5 LFT-WNL. DAY 1 ABG showed PH-7.356, Po2-31.7mmHg, Pco2-60.2 mmHg, O2 saturation-56.1%, and Methemoglobin was 27 %. Patient responded well to the treatment and eventually was shifted out of ICU on Day 3. DAY 3 ABG showed–PH-7.40, Pco2-36 mmhg, O2 saturation-93% and Methemoglobin-1.1 %.

Discussion:
Indoxacarb belongs to the oxadiazine chemical family and is being registered for the control of lepidopterous pests in the larval stages. Insecticidal activity occurs via blockage of the sodium channels in the insect nervous system resulting in paralysis and death. and the mode of entry is via the stomach and contact routes1. Toxic effects of indoxacarb in humans are not described in any of the pesticide database2.

Congenital methemoglobinemia arises from globin mutations that stabilize iron in the ferric state [e.g., HbM Iwata (87His Tyr)], or from mutations that impair the enzymes that reduce methemoglobin to hemoglobin (e.g., methemoglobin reductase, NADP diaphorase).

Acquired methemoglobinemia is caused by toxins that oxidize heme iron, notably nitrate and nitrite-containing compounds, including drugs commonly used in cardiology and anesthesiology3.

Methemoglobin shifts oxygen dissociation curve to the left by oxidation of hemoglobin iron from ferrous (Fe2+) to ferric (Fe3+) state which prevents oxygen binding, transport, and tissue uptake causing hypoxemia, bluish discoloration of skin and mucosa, irritability. Seizures occurs at 10% of meth-hb, Cerebral ischemia occurs at >15% and >60% are lethal. On sampling blood may be muddy or chocolate color. Methemoglobinemia is an unexpected and rare complication of insecticide poisoning. It can be diagnosed by co-oximetry, methemoglobin levels4.

Eventhough not described in pesticide database literature research revealed that only few cases have been reported worldwide about human toxicities of Indoxacarb in the form of methemoglobinemia, rhabdomyolysis and acute kidney injury5-10.

Conclusion:
Early recognition and treatment of Methemoglobinemia associated with indoxacarb poisoning can be life saving and hence this case report.
References


