

FUMIGRAIN POISONING

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ABSTRACT :

Fumigrain is a commonly available fumigant containing carbon tetrachloride and ethylene dibromide in the ratio of 3:1 . It is a commonly used grain preservative for wheat , rice, gram etc . Human poisoning with fumigrain (suicidal ingestion) has not been reported yet in the literature. We report a successful management of a 55 years old female with suicidal ingestion of 2 vials of fumigrain. Treatment remained supportive, gastric manage and no specific antidote .

INTRODUCTION :

Fumigrain is commonly used fumigant as a grains preservative . Human poisoning with fumigrain could be related to suicidal , accidental or inhalational exposure .

Fumigrain contains carbon tetrachloride and ethylene Di bromide in the ratio of 3:1. The liquid is usually kept in an upright position and after opening the ample in an air tight container.

The literature search did not reveal any case report of fumigrain poisoning , however there are case reports on carbon tetrachloride and ethylene di bromide poisoning with accidental or suicidal human exposure .

Carbon tetrachloride (CCl₄) is a colourless, non-inflammable liquid that is formed by chloroform with chlorine in the presence of light . CCl₄ is used as a cleansing and degrading purposes in homes , dry cleaning of clothes, fire extinguishers , precursor of refrigerants and propellants . Due to its significant toxic and harmful effects , most of its use is banned however it is still being used in some industries and along in combination formulations. [1] [7]. Human exposure may be inhalation, dermal absorption following direct skin contact, or it may also be ingested deliberately as a suicidal agent [2]. CCl₄ toxicity after human exposure is due to the generation of free radical CCl₃ and cytochrome P450 metabolites leading to cellular damage and structural alteration through lipid peroxidation . Clinical spectrum of ccl₄ mainly involves central nervous system (CNS) , liver , kidney . The lethal dose of as little as 5 ml could be fatal[3][7] .

Ethylene DiBromide(EDB) (pesticide) , a popular fumigant , non-inflammable ,

colourless liquid with chloroform like sweet odour. EDB is mainly metabolised by a conjugations pathway and oxidative pathway (P 450) leading to generation of free radicals.

[5] EDB is a potent carcinogen and genotoxin in animals , as a result it's use is restricted in USA however it is freely available in India . A large sample of water , food , grains And their derivated products are found to have EDB contents that makes it furthermore as public [4]

[6] EDB exposure could be inhalational , dermal stain , suicidal , oral ingestion . Clinical manifestations may include designed , abdominal pain , diarrhoea , nausea and organ impairment . Toxic dose of about 4.5 ml of liquid EDB 160 mg/kg has been reported to be fatal . [6]

Case Report :

We represent a successful management of a 55 year old female who presented to emergency with alleged history of consumption of 2 ampoules of fumigrain containing ethylene dichloride and carbon tetrachloride mixture in the composition of 3: 1. At home she was immediately given one glass of Ghee by her husband and was then brought to the emergency room. At the time of arrival her vitals, heart rate was 112bpm, blood pressure 140/80mmhg, respiratory rate of 16/min, oxygen saturation(spo2)98% on room air, random blood sugar 139mg/ dl and

GCS(Glasgow Coma Scale) of 15/15. Patient complained of anxiety(ghabrahat) which was not associated with LOC (loss of consciousness), vomiting, shortness of breath, chest pain, sweating, palpitations, pain abdomen, nausea or retching. Nasogastric tube was placed and gastric lavage was done immediately with activated charcoal. AIIMS poison Cell was contacted, which advised gastric lavage with activated charcoal . Gastric lavage was done along with residue coming out cloudy and pale in colour. All supportive and conservative management was started in the emergency. Her lab values of liver & kidney function test and serial CNS evaluation was within normal limits . Patient was conscious and oriented along with no other neurological deficit throughout . However during her stay at the hospital she had complaints of mild headache off and on which was relieved on tablet PCM . Her ABG on arrival was within normal limits with normal anion gap . Her Chest x Ray and uterine toxicology was insignificant. She was a known diabetic and known hypertensive for the past 7 years (tablet Melmet SR 500 BD) and 12 years (tab amlong At 5/50) respectively . Patient has been on regular medications . Patient also gave history of taking anti-depressant medications prescribed by her psychiatrist (tablet sitalopam 10 mg off and on since 12 years).

There is history of lack of sleep , lack of initiation , decreased pleasure in pleasurable activities with suicidal ideation present and past history of impulsive thoughts to harm her own self in order to end her worries .

Patient was managed conservatively safely discharged on day 3 with psychiatric consultation and reassurance to the patient as well as her family .



Discussion :

Fumigrain containing carbon tetrachloride and ethylene Di bromide in the ratio of 3:1 . Human raining off this common formulation has not been reported so far . There has been no case reports of ethylene Di bromide poisoning with lethal outcomes after accidental exposure to EDB while cleaning a tank in pesticide factory [8]. Both the patients were reported to have acute liver and kidney impairment along with metabolic acidosis . In one case, the two vitals of 10 ml each were consumed by patient, timely intervention in the form of one glass ghee was gastric lavage , might have done the trick in reducing absorption and toxicity . The Ayurvedic literature, the ghee has been mentioned as a common household material that delays the absorption and a possible antidote [9]. Gastric management with activated charcoal is a recommended therapy to delay systemic absorption . Our patient had minimal symptoms, mainly anxiety , apprehension , mild abdominal pain and mild headache off and on.

CONCLUSION :

The combination of CCl₄ and EDB has never been reported so far. This case highlights the poisoning with the commonly used grain fumigant in India. The use of commonly used household substances for suicidal poisoning is increasing by the day in the clinical practice .

The treatment remains symptomatic and supportive . There is no antidote for fumigrain poisoning, timely intervention holds the key to successful outcome .

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