Ethylene Dibromide Posioning – Ingestion

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Abstract

A 27 year old married lady was admitted in medical emergency with the history of ingestion of some grain preservative 2 days prior to admission. Symptomatic and supportive treatment was given; however the patient expired on the third day of admission.

The viscera of the patient were sent for chemical and forensic examination. The presence of bromide was reported in the viscera and a final diagnosis of ethylene dibromide poisoning was made.

The history given by the patient and on chemical examination suggested ingestion of Ethylene di-bromide.

Key Words: Ethylene Dibromide Poisoning.

Introduction

Ethylene di-bromide is a non-inflammable, colorless liquid with sweet chloroform like odor. It is soluble in water and most organic compounds. Ethylene di-bromide is used as a scavenger for lead gasoline and used as a pesticide and as an ingredient of formulations for soil, vegetable, fruit and grain fumigation. The fatal dose of EDB varies from 5-10 ml. It has delayed effects and leads to liver and kidney injury. Treatment is supportive and symptomatic.

Case History

This is the case of a young 27 year old female patient. As per history given by the patient and attendants she had consumed four ampules of a substance which is used for preservation of grain. She was taken to a local hospital where she was treated and managed and diagnosed as a case of ethylene di-bromide poisoning. She remained well for 3 hours after which she became symptomatic and developed nausea, vomiting, dizziness and myalgias. She was then referred to our hospital. She presented to the Emergency room in a state of drowsiness with multiple episodes of vomiting and generalized weakness. Gastric lavage was done and the lavage fluid was sent for forensic and chemical examination. She was put on supportive therapy while detailed history was taken and physical examination performed. On examination no specific finding was observed. Investigation was sent from ER which had varied abnormalities. Heamatological profile was deranged including decreased levels of HB (9.6mg/dl) and increased TLC (25000-29000) and platelet count (1,37,000-,156,000). Liver profile was deranged as increased liver enzymes (SBil: 2.7, SGOT-209, SGPT-192) along with deranged coagulation profile (Pt 18, APTT 40, PT-INR 2.4). Renal profile was also deranged with increased levels of urea (55mg/dl) and creatinine (2.6mg/dl). Blood gas analysis also showed metabolic acidosis (Ph: 7.2, Pco2:16.7, Hco3: 10.8). The condition of the patient deteriorated further but she maintained vitals and saturation. The patient was taken up for dialysis as she gone anuric on 24th September 2014. However the next day the condition of the patient remained same and on evening of that day she suddenly collapsed and went into cardiorespiratory arrest and could not be revived. Patient expired on 26th September 2014 at 3.45 am as ethylene di-bromide with multi-organ dysfunction.

Material and Methods

The gastric lavage fluid from the stomach was sent for chemical examination.

Postmortem Findings: The postmortem findings were congestion and necrosis of the lungs, liver, spleen and kidneys.

Results and Discussion

Ethylene Di-Bromide (EDB) becomes toxic when 4-5ml (4ampules) is ingested. Exposure can occur via three routes - ingestion, inhalation and through dermal route via penetration. It can have symptoms in Acute and Chronic form. EDB affects almost every organ of the body. Acute exposure affects the lungs leading to cough, chest pain, dyspnea, bronchitis, pneumonitis, pulmonary edema, hemorrhage, and pulmonary edema. A delayed feature is Reactive Airway Dysfunction Syndrome (RADS). Neurological manifestations include mild central nervous system depression, drowsiness, with rapid onset of unconsciousness and coma. Since EDB is a local skin irritant it can also affect the skin causing itching, erthyema and skin ulceration. Other major manifestations involve the liver and kidneys as evidenced by hepatocyte and tubular necrosis respectively. Gastrointestinal manifestations include nausea, vomiting and diarrhea. EDB also causes derangement of the coagulation profile.

Ophthalmological involvement leading to conjunctivitis is a less common manifestation. The management of EDB poisoning should be aggressive as its symptoms appear in a delayed fashion. The patient with EDB poisoning is managed by decontamination of the affected area and critical area.

Basic Decontamination: Patients who are able may assist with their own decontamination. Remove and double-bag all clothing, including footwear, because ethylene di-bromide penetrates many materials and can remain trapped in them. Leather absorbs ethylene di-bromide items such as leather shoes, gloves, and belts may require disposal by incineration. Flush exposed skin and hair with water for at least 15 minutes, than wash twice with mild soap. Rinse thoroughly with water. Use caution to avoid hypothermia when decontaminating patients, particularly children or the elderly. Irrigate exposed or irritated eyes with tap water or saline for 15 to 20 minutes. Remove contact lenses if easily removable without additional trauma to the eye. If pain or injury is evident, continue irrigation while transferring the victim to the Critical Care Area.

Critical Care Area: Evaluate and support airway, breathing, and circulation as in ABC Reminders above. Establish intravenous access in seriously ill patients. Continuously monitor cardiac rhythm. Patients who are comatose, hypotensive, or have seizures or cardiac arrhythmias should be treated in the conventional manner. EDB does not have Anti-dote. Serum bromide levels can be used to document that exposure did occur. However, bromide levels do not accurately predict the clinical course. Routine laboratory studies include CBC, glucose, and electrolyte determinations.

The cases of Ethylene di-bromide are reported very few in the Uttar Pradesh. The most cases are reported in state of Madhya Pradesh, however the trend of EDB poisoning is increasing the Uttar Pradesh and expected to rise in future.

Conclusion

In the present case the patient had ingested four ampoules of EDB with development of symptoms after 12 hours. The patient developed multi-organ involvement and ultimately succumbed.

References

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