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A Case Report of Bromadiolone Poisoning Presenting with Mild Symptoms

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ABSTRACT

Bromadiolone is a commonly used 2nd generation anticoagulant rodenticides in Central India. It mainly acts by inhibiting the synthesis of vitamin k along with its added potency and tendency to accumulate in liver. Excessive bleeding from digestive tract, skin, mucosal surfaces along with from urinary tract are the hallmark clinical features of bromadiolone poisoning. Along with its use as rodenticides it is also misused as for self-poisoning and homicides. Although the effects of bromadiolone poisoning are well known still very cases of self-poisoning are reported

So here we present a case report of bromadiolone self-poisoning in a 35-year-old man following a family dispute presenting initially with mild symptoms

A 35-year-old man presented to Emergency Medicine Department along with complaints of 1-2 episodes of non-projectile vomiting. On further history taking it revealed the consumption of rodenticide which contained bromadiolone as the main component. Blood investigations revealed a high AST and ALT levels initially along with normal INR values. The deranged LFT levels were addressed after immediate treatment with n acetyl cysteine.

The case suggests us that in patients with bromadiolone poisoning management should be started at the earliest. As mostly the patient presents with only symptoms of nausea and vomiting making it difficult to plan the treatment strategy. So immediate treatment would lead to suppression of symptoms without occurrence of any further complications. Post treatment follow up is also necessary for evaluation of any complications.

Key words: Bromadiolone, Anticoagulant, Rodenticides, Tract, Skin, Mucosal

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INTRODUCTION

Bromadiolone is a second generation 4-hydroxycoumarins which is a novel group of anticoagulant rodenticides called as super warfarin's, which is commonly used against warfarin resistant strains of rats. Central India is currently facing the menace of self-poisoning and suicide especially the rural part of Vidarbha region. There has been dearth of information documented on bromadiolone poisoning, its symptomatology, pathophysiology, complications and management. It is barely reported worldwide. In developing countries like India rodenticides are usually found in every household in rural as well as urban part. Rodenticides are becoming a major source of intentional self-poisoning due to their easy availability. Every year around 3 million cases of poisoning are noted out of which 0.2 million mortalities are reported by WHO [1]. Around 99 % of the mortality is confined to developing countries. In 2011, 12,886 cases of exposure to rodenticides were documented in the National Poison Data System of the American Association of Poison Control Centers. It was also noted that anticoagulants contributed to around 82%–89% of all rodenticide poisoning. Out of these anticoagulants, second-generation anticoagulants, such as bromadiolone, contributed 83%–91% of all anticoagulant poisonings [2].

Arsenic, zinc sulphate or thallium sulphate containing traditional rodenticides were used to produce immediate symptoms after its consumption in rodents. But even the rodents encountering new feed initially for the first time may not take it as whole food, they also have tendency for sample feed and may not take a considerable quantity for few hours. During the test feeding period if the bait causes troublesome symptoms, the rodents are wise enough to understand the cause and its effect. The discovery of newer generation anticoagulant rodenticides was led due to disadvantages of the traditional rodenticides in the developed countries.

Anticoagulant group of rodenticides are used abundantly for control of the agricultural and commensal rodents. Newer anticoagulant group of rodenticides called as "superwarfarins" was introduced due to menace of warfarin resistant strains of rodents. Bromadiolone has a bioavailability of approximately 50%3. After ingestion of rodenticide in mammals, the maximum plasma concentration is reached within 6-9 hrs. Bromadiolone, as well as its two major metabolites, and other similar products are mainly excreted in the faeces (urine: < 1% after 96 h) [3]. Post marketing surveillance remains an important aspect with respect to scarce of documentation on toxicity of rodenticides on human beings. In India, anticoagulant rodenticides do not have long history of use and they have not yet completely replaced the traditional rodenticides; however, most of the currently available rodenticide baits contain bromadiolone, a second generation anticoagulant4. Along with the use for rodenticides it is increasingly becoming popular for suicides and homicides due to easy availability over the counter in the medical or general stores. however, most of the currently available rodenticide baits contain bromadiolone, a second generation anticoagulant [4].

The Google, PubMed and Medscape search revealed only two reported fatal case of bromadiolone poisoning in India.

CASE HISTORY

A 35-year-old male was brought to the Emergency Medicine Department of our hospital with alleged history of suicidal consumption of rodenticide bait under the influence of alcohol intoxication. The patient presented with complaints of 1-2 episodes of foul-smelling vomiting which was yellow in colour, non-projectile, nonbilious and with no evidence of bleeding, following which he was admitted in Medicine ICU. Following consumption, patient did not have any history of syncopal attack, seizure type activity, and headache.

On the basis of rodenticide cover box brought by the relatives which revealed bromadiolone was the chief constituent. As there was no contraindication for stomach wash, gastric lavage was given and supportive measures were initiated. On general examination, patient was found to be conscious, cooperative and oriented to time place and person along with heart rate was - 86/ min which was regular in rhythm with respiratory rate of 18 breaths/ min, blood pressure of 120/80 mm of Hg taken in right brachial artery in supine position and 97% oxygen saturation on room air. On torch light examination Pupils were normal in size, reacting to light. Abdomen examination revealed non tender hepatomegaly with no other significant findings. Nervous system examination did not reveal any specific focal neurological deficit or fasciculation's. Cardiovascular and respiratory examination revealed no abnormality.

His blood investigations at the time of admission revealed haemoglobin: 12.6 g/dl, leucocyte count 5400/ cumm, thrombocytopenia was not seen [platelets were 313,000/cumm]. The liver function test was assessed which showed deranged values of AST levels [348 U/L] and ALT levels [390 U/L] at the time of admission. With INR 1.12 coagulation parameters were normal. Bilirubin level was 2.7 mg/dl, Serum cholinesterase 7.8 U/ml

During hospital stay, patient was initiated on N-acetyl cysteine intravenous infusion with standard loading dose of 150 mg/kg over time period of 15min, following which a dose of 50 mg/kg over 4 hours and then 100 mg/ kg over 16 hours and hence 300 mg/kg was delivered over 20 hours. Patient was also started on dextrose fluids, multivitamins and prophylactic antibiotics.

Patient was monitored daily for coagulopathy, liver function test and kidney function test. Subsequently there was remarkable decrease in deranged levels of AST and ALT. On day 2 the investigations revealed AST 260 U/L and ALT 273 U/L along with normal INR 1.04. On day 3 AST 178 U/L and ALT 193 U/L. On day 4 AST 126 U/L and ALT 143 U/L. Patient had an uneventful hospital stay. Psychiatric evaluation was done and couple counseling was done. Alcohol abstinence was advised. On day 5, patient was discharged with normal liver function and full clinical recovery.

DISCUSSION

Although there has been increase in menace of bromadiolone poisoning only two research articles have been documented till now. Rural part of Central India is a agriculture growing community, which has seen a sudden rise in use of anticoagulant rodenticides in recent years. Along with the advantages of rodenticides against rats it also comes with increase in cases of poisoning in human beings which is need to be documented. Here we are presenting a case of bromadiolone poisoning which presented as episodes of non-projectile vomiting along with deranged AST and ALT levels and increased bilirubin levels.

Mechanism of action

The main Mechanism of bromadiolone is by inhibiting vitamin k synthesis as enzyme vitamin k [1]-2,3 epoxide reductase is inhibited along with clotting factors such as factor II, VII, IX and X. It has extremely slow elimination rate from body mainly due to high lipid solubility, higher affinity for hepatic tissue as it possesses an additional polycyclic hydrocarbon side chain [5,6].

Clinical features of bromadiolone poisoning

The main clinical features of poisoning include tissue and organ haemorrhage which mainly includes skin mucosa and digestive tract haemorrhage along with hematemesis. Along with it also presents with bleeding from various sites such as from nose, gingiva, rectum, gastrointestinal mucosa, or any other internal organ with hematomas at various sites and, hematuria with flank pain. Spontaneous hemoperitoneum has also been described [7-11].

CONCLUSION

According to WHO report on the "International Programme on Chemical Safety" with respect to health and safety guide for Bromadiolone, no definite toxic dose of bromadiolone has been established for humans because of the limited clinical reports available. The onset of signs of poisoning may not be evident until one to several days after ingestion. Though bromadiolone is considered as safe for human beings, fatalities do occur. On the basis of our case report we infer that in patients suffering from bromadiolone poisoning it can present with mild signs and symptoms which are usually reversible and with effective early management with supportive treatment they can resolve spontaneously.

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