Focus on Sciences Case Report

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Suicide Attempt by Injection of Zinc Phosphide: A Rare Plan for Suicide

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Abstract

Introduction: Zinc phosphide is a rodenticide compound which converts to phosphide gas and leads to impairment of mitochondrial respiration. Previously, several cases of suicide attempt by ingestion of metal phosphide including aluminum and zinc phosphide have been reported. However, suicide attempt by injection of zinc phosphide has not been reported in the literature.

Case Presentation: In this paper, we report a suicide attempt by subcutaneous self-injection of zinc phosphide in forearm in a18-year- old female. Allergic reactions, hives, angioedema and suffocation were present in our patient at the time of admission. Vital signs and laboratory tests all were in normal ranges. Supportive therapy was performed for the patient. The patient underwent supervision of a psychiatrist. Citalopram 20 mg and Valproate sodium 200 mg were prescribed for the patient.

Conclusions: Since, zinc phosphide poisoning has a high mortality rate, prompt resuscitation effort is crucial to improve survival. Supportive therapy is all we can do for patients. It seems that injection of zinc phosphide under the skin is not life-threatening.

INTRODUCTION

Zinc phosphide is a dark grey, crystalline powder used as a rodenticide [1]. It releases phosphide gas that interferes with mitochondrial respiration [2]. The number of zinc phosphide poisoning cases has been increased in recent years [3]. Zinc phosphide poisoning has a mortality rate of 37–100% [4].To the best of our knowledge, suicide attempt by zinc phosphide through injection route has not been reported in the literature. Herein, we report a case of suicide attempt by subcutaneous self-injection of 5cc of zinc phosphide who survived.

CASE REPORT

This case was a18-year- old female who was referred to Psychiatry Comprehensive Center, Yazd, Iran from other center in March 2016. She had a suicide attempt by subcutaneous self-injection of 5cc of zinc phosphide (known as rodenticide) in forearm.She had been transferred to the hospital 1 hour after the injection. Supportive efforts had been performed. Afterwards, she was transferred to our hospital. Allergic reactions, hives, angioedema and suffocation were present in our patient at the time of admission. In addition, she had nausea and vomiting for three times. She had a history of previous suicide attempt a few month ago. In social and economic terms, she was from an average family. The pregnant state and family disputes were the contributory causes of the suicidal attempt in our case. She did not have any history of smoking or addiction. The patient was upset and crying during interview. Vital signs all were normal. Laboratory tests including WBC count, Hemoglobin, electrolytes, urea/Cr and arterial blood gas (ABG) all were in normal ranges. Blood culture and discharges from the site were negative. Doppler ultrasonography of the forearm was normal. Supportive actions for the patient was initiated such as: keeping the organ high, fluid resuscitation, antibiotics. Psychiatric consultation was requested. Depression was diagnosed. Afterwards, the patient underwent supervision of a psychia-

trist. Citalopram 20 mg and Valproate sodium 200 mg were prescribed for the patient.

DISCUSSION

Zinc phosphide is an inorganic crystalline compound that has been used to kill mammals and also for suicide attempts in humans. Zinc phosphide is a highly toxic substance and people might expose to this solid poison if they accidentally eat or touch it [3]. Its symptoms vary nausea and vomiting to coma and death. Common symptoms of zinc phosphide poisoning are metabolic acidosis, hypotension and shock symptoms, diarrhea, myocarditis, pericarditis, kidney failure, pulmonary edema, cyanosis, seizures, and impairment of myocardial contractility, circulatory collapse and congestive heart failure. There is a short interval between zinc phosphide poisoning and its toxic effects. Most patients present with abdominal pain and vomiting (about 78%) and our patient had three times nausea and vomiting and she was pale [5]. Chughet al. reported that shock, oliguria, convulsions and coma could be seen in cases of zinc phosphide poisoning [6]. In our patient, circulatory collapse and other severe damage did not develop. Hypotension is a common symptom in cases of zinc phosphide poisoning [3] but blood pressure was normal in our patient. Scientists believe that its toxicity is the result of contact with the gastric acid and it can cause many symptoms.The exact mechanism of toxicity is not understood but recently some studies reject this believe and say intermediate products (such phosphonium) are responsible for zinc phosphide poisoning [7]. Zinc phosphide can absorb from the luminal tract, damage liver and lead to coagulopathy and elevation of aminotransferase levels. In some studies, 30% to 45% of patients had elevated ALT and AST levels. As a result, we must clear the patient's intestines before toxicity develops. PEG is one of the most useful medications for clearing luminal tract [7]. There is no antidote for zinc phosphide and many patients die. All that can we do is supportive efforts. In most cases, patients need to admit in intensive care unit (ICU) [8]. Our patient had three times nausea and vomiting likely due to anxiety. Liver function tests were normal. People who consume zinc phosphide must observed for at least 3 days during hospitalization [3] but our patient injected zinc phosphide and her general condition was good. Hyponatremia and hypokalemia are common in these patients and are caused most probably by water loss (vomiting and diarrhea) and in general view electrolyte disturbances such as metabolic acidosis and respiratory acidosis are common [3].

CONCLUSIONS

The easy availability of zinc phosphide (as rodenticide) has made it easy as a mean of suicide (more among female) and there is no antidote for it. Supportive therapy is all we can do for patients. It seems that injection of zinc phosphide under the skin is not life-threatening.

CONFLICT OF INTERESTS

The authors declare that they have no conflict of interests.

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AUTHOR S' CONTRIBUTIONS

Reza Bidaki, Behzad Vakili Zarch: study design, Mojtaba Babaei Zarch , and Ehsan Zarepur: performind the study, Sogol Ale Saeidi: writing the manuscript.

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