Case Report

Transient Leukopenia in Zinc Phosphide Poisoning

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Abstract

Zinc phosphide is used as a rodenticide. Sometimes it is used for suicide attempts. Most usual clinical manifestations are nausea, vomiting, abdominal cramps, irritability, flash pulmonary edema, reduced blood pressure, cardiac dysrhythmias and non-cardiogenic shock. Some other rare presentations are reported. Hereby, we present a case of young woman poisoned with this drug due to suicide attempt who had unexplained transient leukopenia.

Introduction

Zinc phosphide is used as a rodenticide [1]. It is administered for protecting food corps and grasses [2]. The drug is sometimes used as an insecticide [3]. Phosphine blocks cytochrome-c enzyme and protein synthesis in heart and lung. Most usual clinical manifestations are nausea, vomiting, abdominal cramps, irritability, flash pulmonary edema, reduced blood pressure, cardiac dysrhythmias and non-cardiogenic shock. Some other rare presentations are reported such as hepatitis, acute tubular necrosis, DIC, respiratory alkalosis. Transient hypoglycemia is also reported in literature [4]. Hereby we present a case of young woman poisoned with this drug due to suicide attempt who had unexplained transient leukopenia. Her leukopenia resolved after five days without any therapy.

Case Report

A 27 year old married woman was hospitalized due to retraceable vomiting. Two days later because of suicide attempt, she ingested two spoonful of a dark rodenticide (zinc phosphide). Thereafter nausea and vomiting started. It was not tolerable so she came to our hospital and after primary care, hospitalized. During two days her vomiting continued. She had no other medical history she was alert and oriented and answered asked questions carefully –Her vital signs were stable: Bp=100/70 mmHg, RR=20/min, HR=80/min, BT=36.7°C. In physical examination we could not find any abnormality. Lab findings like urine analysis, CBC, BUN, Cr, Na, K, ALT, AST, ALP, PT, PTT, and INR in the time of hospitalization were normal except for arterial blood gas (ABG) which showed metabolic acidosis. Gradually liver enzymes (ALT, AST) elevated and she became leukopenic and in other days also this condition continued but leukopenia improved gradually from third day. Her first day lab findings were as blow: WBC=1800, Hb= 11.8mg/dl, HCT= 35.8%, MCV= 85.2, MCH=28, RDW=15.1, PLT=133000, Neutrophil =50%, Lymphocyte = 30.9%, PH=7.215, PCO\textsubscript{2}= 29.5mmHg, HCO\textsubscript{3}=13meq/L, Urea= 22 miligrams/dl, Creatinine= 0.7 miligrams/dl, BS=74 mg/dl, ALT= 228, AST= 239, ALP=71, PT= 22,INR=2.2,PTT= 36also U/A was normal. Electro cardiogram showed normal sinus rhythm without arrhythmia. This temperature charted exactly. Serial lab exams were done. Abdominal ultrasonography was normal.

She had no fever during hospitalization, from second day nausea and vomiting were resolved but her leukopenia continued until fifth day of hospitalization. From second day liver enzymes reduced gradually. In fifth day of hospitalization lab exams were as below: WBC=4700, Hb=11.1mg/dl,
PLT=184000, neutrophil=67%, INR= 1, PH= 7.38, Hco3= = 24meq/L.

Patient discharged due to improved clinical condition and lab findings. Two weeks later, the patient visited again; there was no other complication or abnormality in physical exam and lab data. We could not find any reason for her initial leukopenia and this transient leukopenia improved gradually without any specific therapy. We hereby highlight that transient leukopenia can be a complication in a case of zinc phosphide poisoning; It should be looked for all in zinc phosphide poisoning and physicians must be aware about it and in severe conditions prophylaxis of possible infections is necessary.

Discussion
Zinc phosphide (Zn₃P₂) is used as a potent rodenticide [1,5]. It is also administered for protecting of food corps and grasses [2,5]. Massive doses (more than 4-5 gr) may lead to death frequently [6]. Fortunately our patient had nausea and vomiting immediately after ingestion and great amount of drug was exit from stomach. Some forms of Zinc Phosphide are extremely toxic and must be labeled as a dangerous agent [7]. There is some other moderately toxic forms of this drug. Zinc Phosphide hurts stomach mucosa and causes severe gastritis[8]. This was the reason of severe vomiting in the presented patient also. Other symptom of acute zinc phosphide poisoning is shock [6]. Shock was not seen in our patient but weak heart beat and low blood pressure were detected in first hours of hospitalization. Loss of consciousness also is seen frequent in massive ingestions [9] but in spite of this our patient was a little bite lethargic.

Other symptoms include vomiting is seen in poisoned patients, this was also seen in our patient and her diarrhea was very sever. Pulmonary manifestations like cyanosis and crackles are found in patients exposed to this drug [10] but it was not seen in this woman. Fever is sometimes due to direct effect of drug and sometimes it is due to superimposed complications like aspiration pneumonia. Body temperature of our patient most of time was in normal range.

There are so many reports that higher doses of this drug (4-5 gr) may lead to death but sometimes administered doses more than this amounts induced only vomiting and some other clinical manifestations [11], early frequent vomiting may be the reason of survival of this patient who ingested a great amount of zinc phosphide.

Damage to the kidneys is possible but in very massive doses[9]. This event was not happened to our patient and her kidney function examinations and urine analysis were normal all the time.

Elevated liver enzymes due to hepatotoxicity may be seen in a lot of patients with severe zinc phosphide poisoning [12] and in our studied patient also liver enzymes were elevated gradually but two weeks later at discharge time both of the liver enzymes (ALT, AST) returned back to normal values. We could not find any other damages to lungs, heart and central nervous system.

Actually this drug hurts stomach mucosa and causes severe gastritis, released Phosphine gas damage other organs like lung, liver, kidney, heart and central nervous system also some other infrequent damages are reported previously [11]. Chronic poisoning with this drug is not reported [10] frequently but some references showed that chronic exposure with less than lethal doses may produce toxic symptoms [12]. Accordingly we cannot notify chronic poisoning with Zinc Phosphide [13]. Metabolic acidosis is reported and also we found this abnormality in our studied patient, the reason is maybe hypotension or phosphine’s direct effect (cytochrome–c blocking) but also metabolic alkalosis as a rare condition is reported. The reason of this metabolic abnormality is not clearly introduced [14].

This patient presented leukopenia in second day of hospitalization and it disappeared after fifth day without any treatment but we afraid of progression of leukopenia and isolated this patient. So called leukopenia fortunately had no effect on our patient and any superimposed infection was not seen. During follow up period also it was not seen in this woman.

We hereby highlight that leukopenia can be a complication in a case of Zn3P2 poisoning. It should be looked for in all Zn3P2 poisoned patients, and actively followed up if present.

Conflict of interests: The authors declare no conflict of interest.

References