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ZINC PHOSPHIDE TOXICITY IN PATIENTS REFERRED TO AHVAZ RAZI HOSPITAL

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ABSTRACT

Introduction: One of the phosphides that have been reported with poisoning is zinc phosphate. This darkness is also known as the rodent poison or the Rodenticide (zinc Phosphide), with its dark appearance. The aim of this study is investigate zinc phosphate toxicity in patients referred to Razi hospital in Ahvaz. **Material and Methods**: In an epidemiologic and hospital based study, zinc Phosphide poisoned patients referred to Razi Educational Hospital of Ahvaz were studied. The records of all patients with zinc phosphate poisoning were evaluated and demographic data were extracted from patients, including patients 'age. Patients' morbidity was recorded in a questionnaire. All analyzes were performed using SPSS version 22 software. **Results**: In this study, the number of 28 patients with mean age 27.79 ± 11.80 years was analyzed The mean age of men was 14.12 ± 29.60 years and the mean age of women was 25.69 ± 8.48 years There was no significant difference between age of men and women (P> 0.05). Also 15 (53.6%) patients were male and 13 (46.4%) were female. The mean of the dosages consumed was 14.25 ± 3.06 g in the range of 12 to 20 g, and the mean dose in men was 20.0 ± 0.0 and in women was 12.92 ± 1.25, which was significantly higher in males(P<0.05). All patients were treated and no one died. **Conclusion**: Zinc Phosphide poisoning can manage in female and male but need to treatment after exposure very soon and we can change the mortality to morbidity with good diagnostic, monitoring and treatment.

KEYWORDS: Rodenticide, zinc Phosphide, Toxicity, Ahvaz.

INTRODUCTION

Poisoning is one of the major healthcare management system crises today. Extensive surveys show that an important part of the cost of emergency medicine and intensive care units is devoted to poisoned patients around the world.[1,3] Among the various poisonings, one of the most common poisonings is poisoning with pesticides and agricultural herbicides, which account for a major proportion of poisoning and most poisonous patients referred to the healthcare sector after poisoning with these toxins are referred to centers.[4,6] Usually, these poisonings are deliberately or suicidal in children inadvertently and in adults, while unaccustomed poisoning is also common in adults.[7,9] Poisonings with pesticides and herbicides as well as pesticides that inhibit banana animals have different side effects, which vary according to the type of poison and the dose rate as well as the manner of exposure to the toxin and similarly, different morbidity and mortality will follow.[10,12] One of the most widely used pesticides used is metallic phosphide, which is widely used under various commercial titles. Metal phosphodies such as aluminum, zinc or magnesium react easily with water or gastric acid and produce hydrogen phosphide gas. Phosphinum is a degenerate and highly active agent. It has an oxidative effect that results in a range of non-specific cytotoxic effects. It is linked to a range of enzymes involved in cellular respiration and suppresses oxidative phosphorylation, presumably. Phosphine after hydrolysis of the phosphate salts or after inhalation is rapidly absorbed. Low skin absorption is generally unimportant.[13,15] One of the phosphides that have been reported with poisoning is zinc phosphate. This darkness is also known as the rodent poison or the Rodenticide (zincPhosphide), with its dark appearance. Studies on this poison show that inhibition of cytochrome oxidase C is a poisoning agent that can cause various poisonings in different ovaries.[16] The aim of this study was to investigate zinc phosphate toxicity in patients referred to Razi hospital in Ahvaz.

MATERIAL AND METHODS

In an epidemiologic study based on hospital data, zinc phosphate poisoned patients referred to Razi Educational Hospital of Ahvaz were studied. After obtaining permission from the University's Ethics Committee, the records of all patients with zinc phosphate poisoning were evaluated and demographic data were extracted from patients, including patients 'age. Patients' morbidity was recorded in a questionnaire. Patients with incomplete records were excluded from the study and other cases were evaluated. After collecting statistical findings to compare the results, SPSS version 20 was used to compare the qualitative and frequency variables of the two groups using Chi-square test. And for the comparison of quantitative variables, independent t-test or Mann-Whitney test will be used based on the normality of the data. Regression methods will be used to control the predictor variables of depression. Because side effects are secondly outcome, it is not included in the variables table. All analyzes were performed using SPSS version 22 software.

RESULTS

In this study, the number of 28 patients aged between 16 and 64 years old was included in the study and their mean age was 27.79 ± 11.80 years. The mean age of men was 14.12 ± 29.60 years in the range of 16-64 years and the mean age of women was 25.69 ± 8.48 years in the range of 17 and 48 years. There was no significant difference between age of men and women (P> 0.05). Gender examination of patients also showed that 15 (53.6%) patients were male and 13 (46.4%) were female. The mean of the dosages consumed was 14.25 ± 3.06 g in the range of 12 to 20 g, and the mean dose in men was 20.0 ± 0.0 and in women was 12.92 ± 1.25, which was significantly higher in males(P<0.05). All patients were treated and no one died.

Table 1: Mean of Age in patients Disaggregated by gender.

Gender	Age Indices					P-value
	N	Minimum	Maximum	Mean	SD	
Male	15	16	64	29.60	14.126	p>0.05
Female	13	17	48	25.69	8.489	
Total	28	16	64	27.79	11.808	

Table 2: Mean of dose consumption in patients Disaggregated by gender.

Gender	Age Indices					P-value
	N	Minimum	Maximum	Mean	SD	
Male	15	20	20	20.00	.000	P<0.05
Female	13	12	16	12.92	1.256	
Total	28	12	20	14.25	3.066	

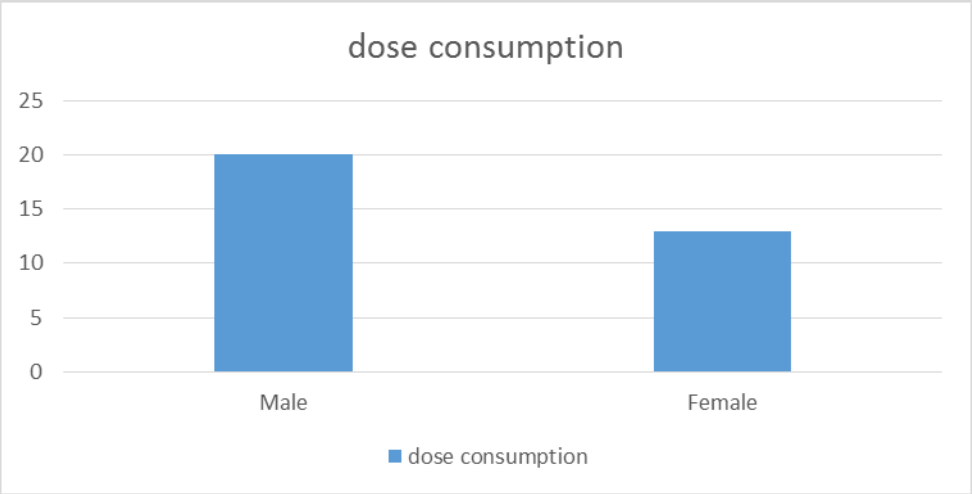

Figure 1: Mean of dose consumption in patients Disaggregated by gender.

DISCUSSION AND CONCLUSION

As reported in the results section, in this study, 28 patients aged 16-64 years were enrolled in the study and their mean age was 27.79 ± 11.80 years. Sexual examination of patients also showed that 15 (53.6%) patients were male and 13 (46.4%) were female. The average dose of the patients was 14.25 ± 3.06 g and in the range of 12 to 20 g. All patients were treated after treatment with poison and visited the treatment center, and none of them died. This study showed that the males with higher age and higher dosage disuse of this toxins. In fact, the findings of this study indicate that timely action in zinc-poisoned patients can lead to non-death of patients, and achievement of successful treatment in different sexes is not different, although it should be noted at the dose rate of the patient due to morbidity

More will be followed by more doses. In the discussion below, several articles will be reviewed to compare the data in this study with them. Sarmaet al[17] in study entitled "Acute pancreatitis due to zinc phosphide ingestion. "Reported that the case of a young woman is described who suffered from acute pancreatitis related to the ingestion of zinc phosphide. This unusual complication was successfully managed with conservative treatment. Also Chugh et al[18] in their research entitled zinc phosphide intoxication symptoms: analysis of 20 cases reported that twenty cases of zinc phosphide (Zn3P2) ingestion (self-poisoning) were seen during the last 5 years (January 1992-December 1996). Poisoning was rare before 1986. Profuse vomiting (100%), pain in abdomen (100%), palpitation and sweating (80%), dyspnea and tachypnea (75%), metabolic acidosis (60%), shock (40%) and hypotension (40%) were the most common presenting features. Five patients (25%) died. The toxic effects were due to liberation of toxic phosphine (PH3) gas which was detected by qualitative silver nitrate paper test in majority of cases. In another study amr et al[19] in article entitle Neuropsychiatric Syndromes and Occupational Exposure to Zinc Phosphide in Egypt reported Eighty-six workers exposed to zinc phosphide (Zn3P2) pesticide were studied for evidence of neuropsychiatric manifestations. They were evaluated clinically, by electroencephalography (EEG), and, in some cases, by electromyography (EMG). All were males (mean age, 35.8 years; mean duration of exposure to zinc phosphide, 11.3 years). Most presented with one (or more) neuropsychiatric symptom(s), including fear of poisoning, anxiety, impotence, and easy fatigue. About half showed evidence of neuropsychiatric signs, including hyperreflexia, polyneuropathy, lumber radiculopathy and cervical myelopathy, as well as anxious mood, impaired attention and psychomotor stimulation. EEG recordings showed abnormal findings in 17.4% of the subjects. The mean age in that group was 39.1 years; mean duration of exposure to Zn3P2was 15.1 years. EMG studies showed evidence of partial denervation of the anterior tibial group of muscles and flexor digiti minimi in 2 of the 30 workers (6.7%) who underwent EMG examination. Electrophoretic pattern of globulin showed that gammaglobulin fraction was significantly increased ($P< 0.005$); α2 and β-globulin were decreased ($P< 0.005$) in exposed workers. Lipoprotein pattern showed that the total lipids, B-lipoprotein and B/α ratio were significantly increased ($P< 0.005$) in exposed workers; the α1lipoprotein was decreased. Triglycerides and cholesterol were significantly increased ($P< 0.001$) and phospholipids and phospholipid/cholesterol ratio were significantly decreased ($P< 0.005$). Finally our result and review of other study showed that zinc phosphide poisoning can manage in female and male but need to treatment after exposure very soon and we can change the mortality to morbidity with good diagnostic, monitoring and treatment.

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