

Response to “Blood Levels of Methemoglobin in Patients with Aluminum Phosphide Poisoning and its Correlation with Patient’s Outcome”

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Dear Editor,

I read with interest the study conducted by Mostafazadeh and colleagues regarding the blood levels of methemoglobin in patients with aluminum phosphide poisoning and its correlation with patient’s outcome published in your journal [1]. In this study, the authors have shown for the first time that in almost all aluminum phosphide (AIP)-poisoned patients, methemoglobinemia is present in some degrees with an association between the blood level of methemoglobin and mortality. Two major points should not be missed about this study; firstly, there is no doubt that AIP poisoning itself can cause symptomatic methemoglobinemia as two previously performed studies have already shown this [2, 3]. However, as you know, potassium permanganate is a strong hemolytic and oxidizing agent that can induce hemolysis and methemoglobinemia [4, 5]. The issue of possible permanganate-induced methemoglobinemia due to gastric lavage by the recommended concentration of this agent (1:10,000) is a matter of debate that warrants further studies in this regard. However, it should be mentioned that from the three previously performed studies on the methemoglobinemia due to AIP intoxication, gastro-intestinal decontamination with potassium permanganate had been performed in one of them [2, 3, 6]. In the present study, as the authors have themselves declared, gastric lavage with potassium permanganate has been done for all of the patients [1]. Of course, it should not

be forgotten that the efficacy of the suggested diluted potassium permanganate for the gastrointestinal decontamination of AIP-poisoned patients has not yet been proven [7]. If gastric lavage with potassium permanganate can really cause methemoglobinemia, certainly, its risk will outweigh its benefit.

Secondly, as the authors have mentioned, some researchers have shown that there is no association between AIP-ingested dose and mortality rate [8]. In addition to the accidental and/or intentional errors in reporting the number of the ingested tablets by the patients or their family members suggested by the authors, this may be due to the ingestion of exposed tablets which have lower phosphine content. When someone ingests these exposed tablets, or dissolves the exposed or non-exposed tablets in water before ingestion, less phosphine will be released in the gut resulting in a less severe toxicity and decreased rate of mortality. The first point has previously been pointed out and illustrated by two other authors [9, 10]. Also, if the patient vomits immediately after the ingestion due to the unpleasant taste and odor of the tablet, he/she will possibly survive [3, 11, 12]. Thanks for this interesting study.

References

1. Mostafazadeh B, Pajoumand A, Farzaneh E, Aghabiklooei A, Rasouli MR (2011) Blood levels of methemoglobin in patients with aluminum phosphide poisoning and its correlation with patient’s outcome. *J Med Toxicol* 7(1):40–43
2. Soltaninejad K, Nelson LS, Khodakarim N, Dadvar Z, Shadnia S (2011) Unusual complication of aluminum phosphide poisoning: development of hemolysis and methemoglobinemia and its successful treatment. *Indian J Crit Care Med* 15(2):117–119
3. Lakshmi B (2002) Methemoglobinemia with aluminum phosphide poisoning. *Am J Emerg Med* 20(2):130–132

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4. Mahomedy MC, Mahomedy YH, Canham PA, Downing JW, Jeal DE (1975) Methaemoglobinaemia following treatment dispensed by witch doctors. Two cases of potassium permanganate poisoning. *Anaesthesia* 30(2):190–193
5. Jetter WW, Hunter FT (1949) Death from attempted abortion with a potassium permanganate douche. *N Engl J Med* 240(20):794–798
6. Shadnia S, Soltaninejad K, Hassanian-Moghadam H, Sadeghi A, Rahimzadeh H, Zamani N, Ghasemi-Toussi A, Abdollahi M (2011) Methemoglobinemia in aluminum phosphide poisoning. *Hum Exp Toxicol* 30(3):250–253
7. Anand R, Binukumar BK, Gill KD (2011) Aluminum phosphide poisoning: an unsolved riddle. *J Appl Toxicol* 31(6):499–505
8. Shadnia S, Sasanian G, Allami P, Hosseini A, Ranjbar A, Amini-Shirazi N, Abdollahi M (2009) A retrospective 7- years study of aluminum phosphide poisoning in Tehran: opportunities for prevention. *Hum Exp Toxicol* 28(4):209–213
9. Mehrpour O, Singh S (2010) Rice tablet poisoning: a major concern in Iranian population. *Hum Exp Toxicol* 29(8):701–702
10. Iraola Ferrer M, Álvarez Li F, Álvarez Cepero R, Álvarez Cepero R, Santana Cano A, Rodríguez Llerena B, Pons Moscoso F, Núñez Almogueva L (2009) Suicide by ingestion of aluminium phosphide: a case report. *Emergencias* 21:228–231
11. Shadnia S, Mehrpour O, Soltaninejad K (2010) A simplified acute physiology score in the prediction of acute aluminium phosphide poisoning outcome. *Indian J Med Sci* 64(12):532–539
12. Akkaoui M, Achour S, Abidi K, Himdi B, Madani A, Zeggwagh AA, Abouqal R (2007) Reversible myocardial injury associated with aluminum phosphide poisoning. *Clin Toxicol (Phila)* 45(6):728–731