



Lessons to be Learnt from Mitochondria in Acute Aluminium Phosphide Poisoning

Deepak Yadav, Rajasri Bhattacharyya and Dibyajyoti Banerjee*

Department of Experimental Medicine and Biotechnology, Postgraduate Institute of Medical Education and Research, Chandigarh, India

***Corresponding Author:** Dibyajyoti Banerjee, Department of Experimental Medicine and Biotechnology, Postgraduate Institute of Medical Education and Research, Chandigarh, India.

Received: August 17, 2019

Published: September 05, 2019

ISSN: 2582-0931

© All rights are reserved by **Dibyajyoti Banerjee., et al.**

Suicidal, homicidal or accidental acute intoxication due to popular fumigant Aluminium phosphide is frequent [1]. In the whole of South East Asia, it is known to the farmers as rice pill or wheat pill. It is widely available and now even through Amazon without a ban at a low price [3]. After consumption, it liberates phosphine gas, which is a mitochondrial toxin. The phosphine diffuses through the body and inhibits mitochondrial respiratory chain. Therefore, aluminium toxicity is lethal, and currently, no antidote is described for cure [1]. Although the toxicity aspect of the fumigant is widely known, there is no appreciable agenda of the policy-makers to ban it. It appears that like other pesticide exposure (like organophosphorous pesticide exposure) control of aluminium phosphide overdose in the near future is far from reality [2].

Recently there is no recognised biomarker for aluminium phosphide poisoning and empirical treatments are provided on clinical examination. It is recently seen that vegetable oil inhibits the release of phosphine from aluminium phosphide in the stomach and clinical evidence is there that intragastric administration of vegetable oil leads to better prognosis compared to universal gastric lavage agents consisting of activated charcoal and potassium permanganate. Authorities think that vegetable oils like coconut oil or liquid paraffin inhibits phosphine release from aluminium phosphide

and thus reduce the toxicity after exposure. So it has to be administered on an urgent basis after aluminium phosphide overdose [4-6]. This is always not practicable due to lack of a diagnostic biomarker of acute aluminium phosphide overdose. Therefore, mankind is of urgent need of biomarker of Aluminium phosphide exposure. We feel that being a mitochondrial toxin mitochondrial disruption is a prominent feature of Aluminium phosphide overdose. Therefore, we recommend a systematic study for mitochondrial marker enzymes like mitochondrial malate dehydrogenase (MDH 2 isoenzyme), succinate dehydrogenase activity testing for diagnosis, screening, and understanding prognosis for the acute poisoning. The first step will be the development of an easy, patient-friendly method development of these enzymes, and then we can systematically study them for the purpose by organizing specific clinical studies for the purpose.

Bibliography

1. Hena Z., et al. "Aluminum phosphide poisoning: Successful recovery of multiorgan failure in a pediatric patient". *International Journal of Pediatrics and Adolescent Medicine* 5 (2018): 155-158.
2. Ghazi MA. "Wheat pill (aluminum phosphide) poisoning. Commonly ignored dilemma. A comprehensive clinical review". *The Professional Medical Journal* 2013 20 (2013): 855-863.

3. https://www.amazon.in/Celphos-10-Gm-80-Pouch/dp/B07MQZBC41/ref=sr_1_2?keywords=aluminium+phosphide&qid=1566021046&s=gateway&sr=8-2
4. Mirakbari SM. "Hot charcoal vomitus in aluminum phosphide poisoning - A case report of internal thermal reaction in aluminum phosphide poisoning and review of literature". *Indian Journal of Anaesthesia* 59 (2015): 433-436.
5. Senthilkumaran S., et al. "Aluminium phosphide poisoning: Need for revised treatment guidelines". *Indian Journal of Anaesthesia* 59 (2015): 831-832.
6. Agrawal VK., et al. "Aluminum phosphide poisoning: Possible role of supportive measures in the absence of specific antidote". *Indian Journal of Critical Care Medicine* 19 (2015): 109-112.

Assets from publication with us

- Prompt Acknowledgement after receiving the article
- Thorough Double blinded peer review
- Rapid Publication
- Issue of Publication Certificate
- High visibility of your Published work

Website: <https://www.actascientific.com/>

Submit Article: <https://www.actascientific.com/submission.php>

Email us: editor@actascientific.com

Contact us: +91 9182824667