

Paraquat Poisoning-A Clinical Challenge

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Abstract: *Objective: Effective management of a case of paraquat poisoning in a limited resource health set up. Study design: Case Report Conclusion: Paraquat being a lethal poison that has no particular antidote requires a multimodal management approach which becomes feasible in a well equipped health centre where there is a ray of hope for survival in the paraquat victims.*

Keywords: Urine dithionite test, ECMO

1. Introduction

Paraquat, is a herbicide (organic compound), ingestion of which leads to severe, often fatal toxicity involving kidney, liver & lung. All 3 vital organs undergo free radical injury by the super oxide anions produced by the compound, lung being the target organ.

2. Case Report

A 22Y old male patient presented to ER with A/H/O paraquat poisoning (20-25 ml). Patient experienced nausea, vomiting shortly after ingestion, for the Rx of which he was taken to a local hospital where gastric lavage was given & referred to our hospital for further Mx. Physical examination in the ER revealed an alert, conscious male without any acute distress, SPO₂ at RA being 97% with both lungs clear to auscultation. Initial normogram, electrolytes, LFT, RFT, CXR, ECG were WNL. Nevertheless, as Mx of such patients poses a clinical challenge to medical & nursing expertise, patient was shifted to ICU for further care wherein Mx was initiated with:

- 1) Fluid replacement therapy.
- 2) Supportive care for patient with effective psychiatric counseling, high dose of vitC, E, selenium, NAC, Corticosteroids to prevent free radical injury & associated inflammatory changes.

Next 24hrs patient C/O epigastric pain, dysphagia associated with blood tinged vomiting, fever spikes. Subsequently developed mouth ulcer, laryngeal edema. Following this, patient experienced shortness of breath, difficulty in breathing for which an initial CXR was done to look for lung involvement-that showed left lower lobe consolidation confirming the beginning of respiratory involvement. Succeeding events were decreased UO, suspecting renal failure, RFT, LFT, ABG was done, all of which happened to be deranged suggesting the patient stepping into MODS. Consequently, after 3 sittings of hemodialysis investigations were repeated & patient was found to be improving clinically at the end of 2nd week. Beginning of 3rd week, patient went into acute distress with SPO₂ of 48% & below with O₂ support that led to requirement of mechanical ventilation to which the bystanders never consented as a result of which patient was put on NIV to which patient was non-compliant and had to put him on HFNO on which patient couldn't maintain saturation. Eventually bystanders consented for mechanical ventilation, patient was intubated & was followed by BAL-all of which was in vain as patient succumbed to death.

3. Discussion

The most common route of poisoning is ingestion of the concentrated solution. After ingestion, once it's absorbed, paraquat is distributed to highly perfused organs such as the lungs, kidneys, liver, and muscles, and remains partly in the intravascular space. Paraquat concentration in the lung parenchyma is very high (10–20 times greater than in plasma) because of active, energy-dependent uptake of paraquat by type 1 and type 2 alveolar epithelium, via the polyamine uptake pathway and explains why lung is the major target organ of paraquat poisoning. Systemic manifestations depend on the amount of paraquat ingested, and patients can be classified into 3 categories:

- 1) **Mild poisoning:** These patients may have gastrointestinal symptoms but usually fully recover.
- 2) **Severe poisoning:** These patients usually develop severe caustic lesions in the gastrointestinal tract, acute renal failure, and progressive pulmonary fibrosis. Deaths occur in 2–3 weeks, from severe respiratory failure.
- 3) **Fulminant poisoning:** These patients suffer multiorgan failure leading to death within hours to a few days after ingestion.

4. Conclusion

Since paraquat has no specific antidote, important approaches would be multimodal Mx like-to prevent accidental exposure & to pursue aggressive decontamination & prevention of further absorption after ingestion-with NAC, to aggressively treat with free radical scavengers, antifibrotics to avoid lung fibrosis, pulse therapy of steroids that has anti-inflammatory effects-all of which were our religious approaches towards our patient. Although this patient falls into the class of fulminant paraquat poisoning that carries a poor prognosis with best efforts of management-this young male could have had better chances of survival in case of availability of investigations like urine dithionite test based on which one can take a call of newer strategies of ventilation, inhalational nitric oxide therapy, B/L lung transplantation, ECMO so on & so forth.

References

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- [3] Case Report: Two Cases of Paraquat Poisoning from Kota, Rajasthan, INDIA Surendra Khosya^{1, 2} and Sunil Gothwal^{1, 2} ¹ Rajasthan University of Health Sciences, Jaipur, India ² Maharaja Agrasen Institute of Medical Education and Research, Agroha 125047, Haryana, India Correspondence should be addressed to Surendra Khosya, drkhosya3[at]gmail.com Received 22 October 2012; Accepted 28 November 2012 Academic Editors: C. Diez, C. Lazzeri, G. Pichler, and K. S. Waxman. . . .