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Case Report

Paraquat – A mortal herbicide

Anakha Kaladharan¹, Shajahan O M², Babu Narayanan^{3,*}, Ranga Prasad⁴

¹Dr.MGR Medical University, KK College of Pharmacy, Chennai, Tamil Nadu, India

²Vijaya Group of Hospitals, Chennai, Tamil Nadu, India

³Dept. of Medical Director of Critical Care Medicine and Emergency, Venkatamma Reddy Institute of Neurosciences, Chennai, Tamil Nadu, India

⁴Dept. of General Medicine, Vijaya Group of Hospitals, Chennai, Tamil Nadu, India



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ABSTRACT

Paraquat (1,1'-dimethyl-4,4'-dipyridylum) is a broad-spectrum liquid herbicide. It is associated with both intentional and accidental ingestion that leads to severe and often fatal toxicity. The clinical signs and symptoms of paraquat poisoning includes Gastrointestinal symptoms such as burns in the throat, difficulty in breathing, sore throat, abdominal pain and vomiting, including hematemesis, Electrolyte abnormalities, Low blood pressure, seizure, shock and coma. This is a case report of young male presented to IMCU with the history of more than 48hrs after the ingestion of paraquat.

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1. Introduction

Paraquat is a broad-spectrum liquid herbicide that is associated with both intentional and accidental ingestion, leading to severe and often fatal toxicity.¹ Paraquat is highly toxic as the breathing of Paraquat can cause lung damage and can lead to Paraquat lung disease. Paraquat is sequestered in the lungs and cause lipid damage in the cell membranes, which results in hepatotoxicity/nephrotoxicity and pulmonary fibrosis.² Paraquat ingestion is a leading cause of fatal poisoning in many parts of Asia, Pacific nations and the Americans.³

Still now, there is no specific clinically proven antidote for paraquat poisoning. Supportive treatment is given to avoid injury to the lungs.⁴ Pulse therapy using steroids (methylprednisolone or dexamethasone) and cyclophosphamide to prevent pulmonary fibrosis,⁵ elimination of paraquat from circulation (haemodialysis), and gastric decontamination,⁶ hemoperfusion or haemodialysis followed by continuous hemodiafiltration or

repeated hemoperfusion may be beneficial if commenced within 4 hours of poisoning.⁷

2. Case Report

A 35-year-old middle aged gentleman with no comorbidities alleged history of consumption of paraquat 150ml at his residence. He was taken to a nearby hospital and came to our hospital for further management. On admission, he had a heart rate of 90 beats per minute, BP of 170/130 mmHg and respiratory rate of 16 breaths per minute. His creatinine value was 4.6 mg/dL, total Bilirubin was 5.4mg/dL, AST was 207 U/L, ALP was 108 U/L, GGTP was 250U/L and CPK was 639 U/L on the day of admission. On the second day the patient had complaints of burning sensation in the mouth and at the abdomen. He was afebrile and vitals were normal. The patient was on Acetylcysteine solution and haemodialysis was done. He had a toxin (paraquat) induced AKI and hepatitis. He had oliguria which progress to anuria. His BP on the second day was 150/90mmHg and heart rate was 98 beats per minute. He was administered methylprednisolone (dose of 1g/day), cyclophosphamide

* Corresponding author.

E-mail address: drbabunarayan@gmail.com (B. Narayanan).

(15mg/kg/day) along with pulse therapy, dexamethasone (20mg/day) and cefuroxime from the day of admission. On the third day the patient had fever spikes, coated tongue, complaints of breathing difficulty and increased respiratory works. The patient was intubated and was on a mechanical ventilator. The pulse rate was 152 beats per minute. Renal and hepatic parameters elevated despite the medical measures adopted. On the fourth day, his x-ray was worsening, and he still had tachycardia and respiratory acidosis. The drugs Methyl Prednisolone, Cefuroxime, Cyclophosphamide and Acetylcysteine were continued. The patient expired on the next day.

3. Discussion

Due to the widespread availability and inexpensiveness people choose Paraquat to commit suicide. Paraquat ingestion is the leading cause of fatal poisoning. If ingested, paraquat can induce a burning sensation in the mouth, throat, gastrointestinal irritation, abdominal pain, loss of appetite and vomiting.¹ Paraquat is a compound which will be rapidly distributed all over the body and a high concentration in lungs and kidney. Paraquat will cause significant damage to organs, including the lung, liver, myocardium and kidneys with the highest concentration of paraquat found in the lungs.⁸ Fibrosis are common if large amount of paraquat is ingested. It will be followed by liver failure, lung failure, kidney failure and heart failure. If the patient is admitted within one hour of ingestion, decontamination procedures and prevention of further absorption of paraquat from the body using charcoal can be done. Nasogastric suction can be done if admitted within one hour. Immunosuppression along with the combination of cyclophosphamide and methylprednisolone was shown to be beneficial in moderate to severe case by prevention of ongoing inflammation.⁹

There is no specific antidote available for paraquat poisoning¹ and the only treatment involved is to prevent the further absorption. This is applicable only if the patient is presented to the hospital at least within one hour of ingestion.

4. Conflicts of interest

All contributing authors declare no conflicts of interest.

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Author biography

Anakha Kaladharan, Pharm D Intern

Shajahan O M, Clinical Pharmacologist

Babu Narayanan, Medical Superintendent and Chief Medical Officer

Ranga Prasad, Senior Consultant

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