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An unusual presentation after IV paraquat injection

Han-Wei Mu

China Medical University Hospital, Taiwan

Objective: Self-harm by oral paraquat ingestion is a common suicide method in Taiwan. However, poisoning by intravenous injection is extremely rare and higher mortality than that by oral route has been noted[1,2]. Herein, we present a case with tongue and retropharyngeal ulcer who died of respiratory failure after intravenous injection of paraquat.

Case report: A 34-year-old female presented to emergency department due to injection of 100cc of diluted paraquat (50cc 24% paraquat in 500cc normal saline) to her right median cubital vein one hour prior admission. She suffered severe vomiting without throat pain at first. Physical examination showed no oral ulcer or erythematous change around injection site. The urine qualitative sodium dithionite test shows light-blue color. Laboratory data reveals normal initial renal function, plasma paraquat concentration is 28.33 µg/mL, and urine paraquat concentration is 26.72 µg/mL. Charcoal hemoperfusion was commenced for 6 hours. Nevertheless, her renal and liver function kept deteriorating over the following one week, peaking at day 5 and day 4, respectively. Progressive pulmonary fibrosis and hypoxia developed subsequently, and she was expired despite mechanical ventilation at day 11. Surprisingly, throat pain developed since day 4 and ulcerations over tongue and posterior pharyngeal wall was noticed. She strongly denied oral ingestion of paraquat throughout the course.

Conclusion: Intravenous paraquat poisoning is a rare presentation and often results in more severe outcome than oral ingestion. Expeditious clinical course, such as fulminant and severe poisoning is usually associated and changes dramatically and earlier. This patient encountered severe poisoning despite aggressive and rapid decontamination by hemoperfusion, similar to other cases reported in the literature.

One of the most common manifestations of paraquat poisoning is oral ulcer through the mechanism of direct oral-pharyngeal mucosa injury after oral ingestion. However, our patient denied oral paraquat ingestion but still developed tongue and retropharyngeal ulcers. It is hypothesized that oxygen reacts with paraquat via redox cycle commonly in kidneys, lungs, and peripheral tissue, producing oxidative injury and causing cell damage. According to these mechanisms, the oxygen-rich organs, such as lungs and upper airway, are possibly more affected than others. However, this hypothesis still needs further investigation.

References:

1. Huan-Wen Chen, Intravenous Paraquat Poisoning. *J Chin Med Assoc* 2009;72(10):547–550
2. Yoonhee Choi, A case of paraquat intoxication caused by intravenous injection. *American Journal of Emergency Medicine* (2008) 26, 836.e3–836.e4