

Acute systemic paraquat intoxication: survival without long term complications

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Introduction

Paraquat intoxication accounts for the highest mortality rate from pesticides and herbicides [1]. Survival without long term complications following paraquat poisoning with evidence of systemic intoxication is extremely rare. Improvement in survival following paraquat ingestion has been reported after introduction of a new formulation with INTEON[®] technology. The formulation consists of the principal compound (Gramoxone inteon) and a diluent (Terwet sticker) which need to be mixed before application. The formulation contains an alginate that converts to a gel under stomach acid conditions, increases emesis, and is purgative. This reduces the amount of paraquat absorbed. In a Sri Lankan study, the new formulation has been reported to improve overall survival following paraquat ingestion from 25.6 to 35.3% [2]. However, there are no data on survival rates following paraquat poisoning with systemic intoxication, and most survivors are known to be left with long term complications such as lung fibrosis. A previous report describes a patient with acute paraquat intoxication who survived after aggressive therapy with digestive decontamination and haemodialysis followed by anti-oxidant therapy (deferoxamine and acetylcysteine), but 14 months later continued to have evidence of paranchymal lung disease [3].

We report a patient who had ingested the new formulation (paraquat INTEON[®]) and developed “paraquat tongue” and acute renal failure, indicating systemic absorption, who survived without any long term complications.

Case report

A 25-year old man was admitted to hospital 4 hours after deliberate ingestion of nearly 35ml of paraquat. He had ingested only the principal compound without mixing it with the diluent. He complained of a burning sensation in his throat but was clinically stable. He was given gastric lavage immediately and multiple doses of Fuller’s earth till it appeared in the stools. Urine and plasma paraquat levels were not measured owing to unavailability of this test in our hospital. The baseline biochemical variables, including

renal function tests, were normal on the first day. He developed “paraquat tongue” (figure) by the second day, his urine output fell to 300ml/24 hours, and serum creatinine rose to 4.2mg/dl on the third day, suggesting systemic paraquat intoxication.

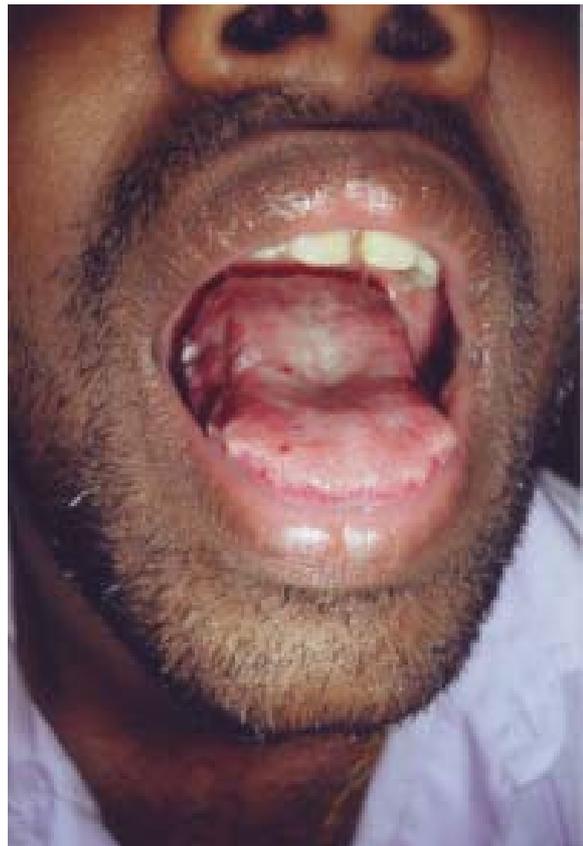


Figure. Paraquat tongue.

On conservative treatment, the serum creatinine level rose to 5.6mg/dl by the sixth day, but fell to 1mg/dl with gradual improvement in urine output to normal levels over the next two weeks. Liver functions, serum electrolytes, arterial blood bicarbonate and PaO₂ were normal throughout the hospital stay, and there was no evidence of lung fibrosis on a chest xray taken on day 14. After discharge he was seen as an outpatient, and 3 months

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after discharge, follow up lung function tests, high resolution CT scan of the chest, renal and liver function tests were normal, suggesting no permanent sequelae.

Discussion

Paraquat causes multiple organ toxicity which affects the central nervous system, heart, lungs, gastrointestinal tract, liver and kidneys. The ingested amount, urine and plasma levels of paraquat [4,5], time to reach therapy, serum creatinine concentration, arterial blood bicarbonate and APACHE scores are initial prognostic indicators in acute paraquat intoxication [6,7]. It carries a high mortality. Oxidative injury is thought to be the major mechanism. After oxidative destruction, recruitment of inflammatory cells leads to late and irreversible pulmonary fibrosis [8]. Patients with impaired renal function on the third day after intoxication have a significantly higher mortality in the late clinical course. Progression of renal failure is also a poor prognostic sign for late mortality [9].

This patient had systemic intoxication (acute renal impairment) following paraquat ingestion and also features that suggest a poor prognosis. However, he survived without any long term complications. Although he had ingested the new preparation of paraquat, the patient had ingested only the principal compound, without mixing it with the diluent which could have reduced absorption.

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