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Acute kidney injury following ingestion of oxalic acid (H₂C₂O₄) and potassium permanganate (KMnO₄) – A review

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Objectives: Intentional self-poisoning with a laundry detergent containing oxalic acid (H₂C₂O₄) and potassium permanganate (KMnO₄) is a significant medical problem in Sri Lanka. Hospital admissions for poisoning have increased over the last ten years. Acute kidney injury (AKI) is a frequent consequence. Through this review, we intended to gather information on kidney injury as a clinical manifestation following H₂C₂O₄ and KMnO₄ poisoning.

Methods: We have reviewed case reports and articles following intentional self-poisoning with H₂C₂O₄ and KMnO₄ using the following data sources: Pubmed, papers cited in publications retrieved and the worldwide web (using google).

Results: 352 patient's data reported in the literature. 34 died. Of 157 patients whose serum creatinine (sCr) data available, 113 developed AKI. Highest reported sCr was 7.04 mg/dl. Of 181 patients who had clinical monitoring data, vomiting, abdominal pain, back pain and oliguria reported as consequences of AKI. Nineteen received or needed dialysis. Renal biopsy indicated tubulointerstitial nephritis/acute tubular damage. Calcium oxalate crystals observed. Fifteen patients showed kidney congestion. Post mortem findings of 16 patients revealed swollen kidneys. Increased levels of urinary albumin, clusterin, neutrophil gelatinase associated lipocalin (NGAL), kidney injury molecule 1 (KIM-1) and osteopontin observed in 63 patients who had AKI according to acute kidney injury network (AKIN) criteria.

Conclusions: Ingestion of H₂C₂O₄ and KMnO₄ developed varying degrees of AKI from mild to severe. Deposition of oxalate crystals in the tubular epithelium was the main cause of AKI. Distal and proximal tubular damage were more common.