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### Two rare case reports of ingestion of ammonium hydroxide and novel study of gastrointestinal toxicity

Varan Perananthan<sup>1,2</sup>, Thilini Wijeyrathna<sup>2</sup>, Amitesh Nagaratnam<sup>2,3</sup>, Indika Gawarammana<sup>2</sup>, Andrew Dawson<sup>1,2</sup>,  
Nicholas Buckley<sup>1,2</sup>

<sup>1</sup>Department of Pharmacology, University of Sydney, Sydney, Australia; <sup>2</sup>South Asia Clinical Toxicology Research Collaboration (SACTRC), University of Peradeniya, Sri Lanka; <sup>3</sup>Faculty of Medicine, University of Adelaide, Adelaide, Australia

**Objective:** We report the only two adult cases of ammonium hydroxide (NH<sub>4</sub>OH) ingestion described in. Both cases showed clinical evidence of gastrointestinal toxicity and using Intestinal Fatty Acid Binding Protein (IFABP), a novel biomarker we attempted to quantify the extent of enterocyte damage. Procalcitonin was also tested as a maker of bacterial sepsis to ascertain whether there was a link between enterocyte damage and infection secondary to bacterial translocation.

**Case reports:** A 45 year-old previously well male was brought in by family with reduced level of consciousness after ingestion of unknown quantity of industrial NH<sub>4</sub>OH (29% solution, industrial grade) with suicidal intent. He was subsequently intubated due to his level of consciousness (GCS 7, E2V1M4). On Day 3, he was still intubated and had a haemoglobin (Hb) drop from 123 to 98 g/dL and a urea rise from 14.1 to 23.2 mmol/L without clear evidence of melaena or haematemesis. His Hb stabilised with only supportive measures and an upper endoscopy was not performed due to resource limitations. By Day 5 he was extubated and reported abdominal pain, dysphagia and odynophagia. The peak IFABP level was 1274 pg/mL and procalcitonin was 2.0 ng/mL 7.7 hrs following presumed ingestion. A 23 year-old previously well female presented 24 hours after consuming 100 mL of NH<sub>4</sub>OH (5.4% solution) used as a cleaning product. She presented due to ongoing vomiting associated with oropharyngeal pain. On Day 2, her vomiting had ceased but she had ongoing odynophagia, epigastric pain and febrile episodes up to 38.2°C. Her symptoms resolved with conservative management and oral antibiotics whilst her Hb remained stable. Her peak IFABP was 865 pg/mL and procalcitonin was 5.8 ng/mL, 27.2 hours following ingestion.

**Conclusion:** We report the only two adult cases of NH<sub>4</sub>OH ingestion and describe severe gastrointestinal damage both clinically and biochemically. IFABP, currently only a marker used in research settings, was elevated in both cases but only marginally below that of levels seen in mesenteric ischemia (levels greater than 1300 pg/mL). Unfortunately, gastrointestinal endoscopy and upper gastrointestinal contrast studies were not able to be done due to resource limitations which would have been helpful in comparing endoscopic/radiological to biochemical damage. The utility of a marker for enterocyte damage especially in caustic solution ingestion can allow clinicians to monitor progress, predict complications and evaluate the need for invasive procedures.