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Metabolic Acidosis and Caustic Injury: A Result of Lacquer Thinner Poisoning

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This is a rare case of non-accidental ingestion of lacquer thinner by a 24 year old male who presented with high anion gap metabolic acidosis and chemical burn to the mucosa. He was managed as a case of methanol toxicity and caustic ingestion, a medical emergency requiring immediate treatment.

Introduction: Lacquer thinner, one of the most common household and work place chemical used in thinning paint is known to contain a myriad of hydrocarbons. Current data shows that toluene, its aromatic hydrocarbon component, is responsible for the toxicity. This case revealed that lacquer thinners contain poisonous substances other than toluene such as methanol, acetic acid and methyl ethyl ketone.

Case Report: A 24 year old male was brought to the Emergency Department due to changes in behaviour and abdominal pain after deliberate ingestion of 150ml lacquer thinner. As a suicide attempt after an alleged fight with his spouse, he developed burning non-radiating epigastric pain an hour after ingestion. He then vomited a cup of blood and was subsequently taken to a local hospital where he was given sodium sulfate to hasten elimination. He was transferred to PGH 9 hours after initial treatment with stable vital signs, GCS 15 and no cardiorespiratory distress. He was clinically inebriated despite no co-ingestion. Physical exam showed whitish membranes on hard palate and posterior pharyngeal wall and direct tenderness on epigastric area suggesting alcohol intoxication and caustic injury. Significant laboratory findings included High Anion Gap Metabolic Acidosis (P02 90.2, pH 7.36, pC02 20.7, HCO3 10.4, Oxygen saturation 95Chloride 107). The patient was given Folinic Acid as an antidote to methanol. Immediate endoscopy showed grade 3A mucosal injury, circumferentially sloughed off mucosa of the esophagus and duodenum. The patient ultimately underwent exploratory laparotomy and tube jejunostomy insertion as definitive management.

Case Discussion: Methanol Toxicity Methanol is a toxic alcohol that is rapidly absorbed and distributed in the body. Formic acid, the metabolic by product of methanol, is a mitochondrial toxin which inhibits cytochrome oxidase and interferes with oxidative phosphorylation. Its accumulation leads to poisoning manifested by CNS depression, metabolic acidosis and visual changes. Management includes rapid correction of the acidosis and early prevention of the formation of this toxic metabolite. Its antidote --Folinic Acid accelerates detoxification of methanol by enhancing the metabolism of formic acid to harmless carbon dioxide and water.

Caustic Ingestion: The degree of injury upon ingestion of a caustic substance is determined by its pH, concentration, contact time, volume and pre-morbid condition. Ingestion of strong acids produces coagulation necrosis resulting in perforation, strictures and gastric obstruction. Endoscopy is the gold standard for evaluation of injury. Esophageal mucosal burns care classified by endoscopic grading system: grade 1 burns involve hyperemia of mucosa and tissue edema, grade 2 burns are blisters, erosions and whitish membranes and grade 3 burns involve deep ulcerations and extensive necrosis. The key priority in management is airway maintenance and stabilization.

Conclusion: Household and workplace products may contain various poisons that are capable of causing serious physiologic morbidity. Early identification of substance ingested is vital to anticipate potential damage and degree of toxicity. In this case, high clinical suspicion based on careful history and physical examination was a critical factor in the diagnosis and timely intervention.