to Department of Medicine for investigation of excessive weakness, nausea, and pain upper abdomen. Three days prior, he had ingested a phenol preparation. There was no history of taking any drugs or other substances than the phenol preparation. On examination he had icterus, cyanosis and was afebrile with a heart rate of 108 beats per minute; blood pressure was 110/70 mmHg and cola coloured urine. Although patient had cyanosis, he was not dyspnoeic and his SpO₂ level was maintained around 95%. The rest of clinical examination did not reveal any abnormality.

On investigation the Hb concentration was 7.8 gm/dl, white cell count 23,300/mm³, platelets 1,80,000; reticulocyte count of 1.5%, peripheral blood smear showed normochromia and anisocytosis. Total bilirubin was 11 mg/dl with an indirect fraction of 10.0 mg/dl. SGOT (AST), SGPT (ALT) levels were 78 and 63 IU/L respectively and alkaline phosphatase was 190 IU/L, and INR was 1.09. Blood urea was 83 mg/dl and serum creatinine was 2.0 mg/dl. G6PD levels were normal.

Based on clinical examination and investigations a diagnosis of phenol induced intravascular hemolysis (hemoglobinuria, anisocytosis, elevated indirect bilirubin) with metabolic acidosis (ABG) with methemoglobinemia (cyanosis, normal SpO₂, normal arterial Po₂) with AKI (deranged renal function tests) was made. Methemoglobin levels cannot be done due to financial constrains.
Patient was started on antibiotics (injection cefotaxim, injection metronidazole), proton pump inhibitors, antiemetic’s, diuretics, blood transfusions and intravenous fluids. He was also given injection methylene blue presuming significant methemoglobinemia was present. Injection sodium bicarbonate was given to counteract acidosis. Although his cyanosis decreased, his general condition deteriorated and he developed MODS. His liver function test became further deranged and patient went into respiratory failure for which he was intubated and kept on ventilatory support. Inspite of above supportive measures, we were not able to save the patient. Patient expired on 6th day after admission.

**Discussion:**

This patient presented with severe intravascular hemolysis with hepatic injury, metabolic acidosis and methemoglobinemia after phenol consumption. There are many reports on the toxic injury with phenols including cases with fatal outcome\(^1\). Acute toxicity causes intense burning sensation in mouth, throat, and stomach. Systemic side effects can involve all organ systems. Phenol is rapidly absorbed into the blood and there may be hyper- or hypo-thermia, tachycardia, tachypnoea, pronounced general weakness, dizziness, nausea, CNS depression, ARDS, hemolysis, renal dysfunction and shock leading to death\(^8\). The average fatal dose is \(2g\). It is excreted chiefly in the urine and also by the liver, lungs, and skin\(^6\).

Very little is known about the metabolic effects of crude phenol, but it may share the ability of its derivatives like dinitrophenol, pentachlorophenol to interfere with the oxidative phosphorylation in cells\(^1\). Storage of energy in the form of adenosine triphosphate is prevented, thereby leading to a compensatory increase in the basal metabolic rate which is responsible for most of the principal clinical features of the toxicity of this substance. The main source of energy in red blood cells is anaerobic glycolysis. Energy is stored in the molecules of adenosine triphosphate, a process that might be prevented by the toxic effect of the phenols. Due to shortage of energy, red blood cells cannot continue to perform their vital functions like preventing the osmotic equilibrium across the cell membranes, the cation pump and cell deformability. This metabolic handicap may lead to premature lysis of the cells causing haemolysis\(^1\). Also, phenol may produce Heinz bodies and contribute to haemolysis\(^7\). No definitive treatment other than supportive measures is available at present. Therefore, we recommend that utmost precautions should be taken while using this potent and widely used chemical.

**References:**

2. Bruce RM, Santodonato J, Neal MW. Summary review of the health effects associated with phenol. toxicol ind health [pubmed].