NITRIC ACID POISONING- A CASE REPORT

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Abstract

Acids are common agents resulting in toxicological emergencies worldwide. Nitric acid is fuming yellow color acid and because of this property cases of poisoning by nitric acid are rare. An elderly male, with alleged history of acid consumption, died after 7 days of hospitalization. Chemical analysis report of viscera did not revealed any poison. Histopathology showed focal necrosis, congestion and inflammation of liver and mesentery. History of acid ingestion, yellowish staining of gums, liver, lung and spleen, perforated stomach subsequently causing chemical peritonitis and diaphragm rupture confirmed the diagnosis of nitric acid poisoning. Acids are useful common chemicals which are easily available in the open market thus public should be educated towards their potential toxicity. © 2011 Karnataka Medico Legal Society. All rights reserved.

Key words: Corrosives, Nitric acid, Suicide.

Introduction

Corrosives are common household and industrial agents, which increases the risk of intentional or accidental poisoning. They are called as contact poisons as they corrode and destroy the tissues they come in contact with.[1] Mineral acids are corrosives in concentrated form and irritants in dilute form.[2] They act by extracting water from tissues, coagulating proteins and converting hemoglobin to haematin.[3] Injuries from acids are mainly in the form of corrosive burns to the skin after accidents in the home, school, college or industrial plant.

Most acid poisoning results from inhalation of acid fumes, fuming acid vapors or from ingestion of strong acids.[4] Because of the easy access to corrosives, morbidity and mortality due to accidental, suicidal or homicidal exposure is not uncommon. [1, 5,6] Here we report a case of nitric acid ingestion by a 72 year old man.

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Case Report

A 72 year old male was admitted to the hospital with history of nitric acid ingestion. He died after 7 days of hospitalization. No other details about procurement of poison were available.

At medicolegal autopsy, external examination showed yellowish white discoloration of gums and a small abrasion of inner aspect of upper lip. No other external injuries were present on the body. Internally, pleurae contained 500 ml straw color fluid bilaterally. Brain and lungs were congested. Yellowish stains were present on the undersurface of left lung, undersurface of liver and superior surface of spleen. (Fig.1 &2) Esophageal mucosa was corroded, stomach was perforated and empty. Diaphragm was perforated on left side, peritoneum contained 400 ml of straw color fluid. Multiple whitish nodules were present in the mesentery.

Chemical analysis report of viscera did not reveal any poison. Histopathology of mesentry showed adipose necrosis, inflammation and reactive hyperplasia of Lymph nodes. Diagnosis of Nitric acid was made on autopsy findings and history.

Fig 1. Yellowish stains on the undersurface of left lung

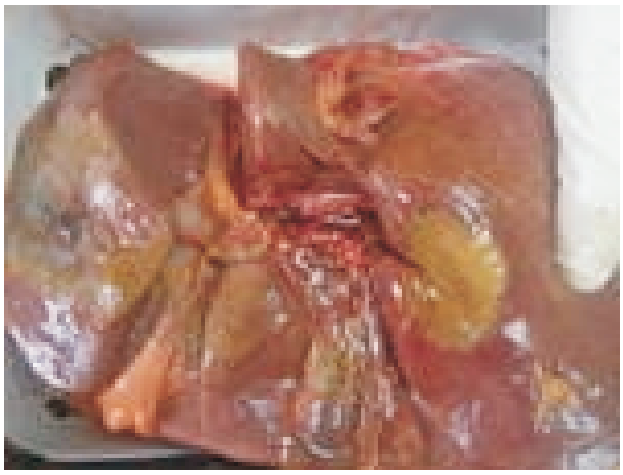

Fig 2. Yellowish stains on undersurface of liver

Discussion

Nitric acid reacts with organic matter to produces picric acid causing yellowish discoloration of the tissues.[2] These stains can be differentiated from those caused by iodine by applying ammonia solution which decolorizes iodine stains but have no effect on nitric acid stains.[2]

It being a strong acid can perforate the stomach resulting in chemical peritonitis. Usual fatal dose is 10-15 ml.[2] In, the present case, history of acid ingestion, yellowish staining of gums, liver, lung and spleen, perforated stomach subsequently causing chemical peritonitis and diaphragm rupture confirmed the diagnosis of nitric acid poisoning. Chemical analysis report was probably negative as 7 days had passed since intoxication leaving no poison residues in the body. Abrasion on inner aspect of lip was probably caused during treatment. Possibility of forceful administration can be ruled out as there was no other evidence of restraint/intoxication for forceful ingestion. Probably this instance was suicidal as nitric acid is easy to detect reducing the chances of homicidal or accidental use.

Acids are useful common chemicals which are easily available in the open market thus public should be educated towards their potential toxicity. Acids are dangerous and sometimes even a timely medical help may be of no use as outcome also depends on quantity and concentration of the acid consumed as well as health status of the individual.

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