Case report
Common household products can be fatal: a case report of death due to shampoo ingestion.
Dr. S. S. Waghmare, Dr. H. R. Thube, Dr. K. U. Zine.

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Abstract

In our daily routine we use various chemicals for household and body care purpose. One example is shampoo which is viscous liquid used for purpose of washing hairs and it is relatively harmless. The shampoo contains various chemical such as surfactant sodium lauryl sulfate or sodium laureate sulfate, with a co-surfactant, most often coc-amido-propyl betaine in water. Another type of shampoo is anti-lice shampoo, which contains sometimes potentially danger organophosphate chemical compounds in trace amount. Accidental ingestion of such products were common in children but usually it is not danger to life. We reported a case of 2 year old baby who accidently ingested shampoo at home. Baby was admitted for few hours in hospital and received basic treatment. But she succumbed to death. So presenting this unusual case of death due to ingestion of household chemical in the form of common shampoo.

Key words Shampoo, Accidental poisoning, Surfactant, Fatality, Sodium lauryl sulfate.
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In our daily routine we use various chemicals for household and body care purpose. One example is shampoo which is a viscous liquid used for purpose of washing hairs and it is relatively harmless. The shampoo contains various chemical such as surfactant sodium lauryl sulfate or sodium laureate sulfate, with a co-surfactant, most often coc-amido-propyl betaine in water. Another type of shampoo is anti-lice shampoo, which contains sometimes potentially danger organophosphate chemical compounds in trace amount. Accidental ingestion of such products were common in children but usually it is not danger to life. We reported a case of 2 year old baby who accidently ingested shampoo at home. Baby was admitted for few hours in hospital and received basic treatment. But she succumbed to death. So presenting this unusual case of death due to ingestion of household chemical in the form of common shampoo.

Introduction
In India various natural products were used as a hair care preparation since ancient times. With the introduction of western culture in era of colonial government use of different chemicals in body care products had increased. One example is shampoo. Shampoo is a hair care product used primarily for the removal of dandruff, oils, dirt, skin particles, environmental pollution and/or other contaminant particles that gradually build up in hair. Shampoo having different types which includes routine hair care shampoo, Anti-lice shampoo, medicated anti-dandruff shampoo, animal shampoo etc. These products are relatively harmless but there are few reported cases of poisoning due to use of anti-lice shampoo. (1)

Contents of shampoo The more important ingredients in shampoo formulations are water, detergents, foam boosters, thickeners, conditioning agents, preservatives, modifiers, and special additives. Common primary detergents used in shampoos are ammonium lauryl sulfate, sodium lauryl sulfate, and sodium lauryl ether sulphate. Propylene Glycol (PG, Polyethylene Glycol (PEG), and Ethylene Glycol (EG) are all petroleum derivatives that act as solvents, surfactants, and wetting agents. Typical materials include lauramide DE or cocamide DEA as foam booster. (2)

The allergens most commonly present, in order of prevalence are as follows: fragrance, cocamidopropyl betaine, methylchloroisothiazolinone/methylisothiazolinone, formaldehyde releasers, propylene glycol, vitamin E, parabens, benzophenones, iodopropynyl butylcarbamate, and methyl dibromoglutaronitrile/phenoxethanol. (3)

Current anti-dandruff agents primarily have an antimicrobial mode of action, and inhibit growth of Malassezia spp. (4) Animal shampoo as well as some anti-lice shampoo contains pyrethrin as a base contain. (2)

Case report
2 year old girl brought by her parent to casualty of government medical college Aurangabad in un-conscious state. Parents gave history of accidental ingestion of common shampoo at home 2 to 3 hours back. On clinical examination her pulse was weak and rapid. She
was responding to only deep stimuli, pupils sluggishly reacting to light. There was no oozing from mouth or nose. On duty medical officer tried to resuscitate her with basic ABC management but after few minutes she succumbed to death. Medical officer sent the body to morgue for autopsy.

**Autopsy findings**

**External examination**<br>
In autopsy room, corpse of well-nourished baby was in supine position. Face of the deceased was congested. Eyes were partially closed, pupils fixed and dilated, while conjunctiva shows congestion. Nails of upper limbs shows frank cyanosis. There was no oozing from mouth or nose. There were no injuries present over body. Post-mortem lividity present over back, back of upper and lower Limbs, buttocks except pressure points and is fixed.

![Figure 1. Bubbles seen in the gastric content](image)

**Internal examination**<br>
On dissection internal organs were congested. Both lungs were congested and heavy. On cut section lungs shows oozing of blood tinged fluid with copious froth. Trachea and upper respiratory tract shows full column of copious, whitish & shiny froth along with thick blood tinged mucus (figure no. 2). Oesophagus contains vomitus material in the form thick liquid with froth.

![Figure 2. Copious, whitish & shiny froth along with thick blood tinged mucus](image)

Whole respiratory tract shows congestive mucosa. On opening stomach shows 100 cc to 200 cc whitish viscous fluid admixed with bile and mucus. There were large amount of bubbles present in upper GI Tract (figure no. 1). Morphologically all other organs were in normal limits. Viscera was preserved and sent to forensic science laboratory for chemical analysis. Cause of death was given as asphyxia following aspiration of viscous liquid however samples kept for chemical analysis.

**Discussion**
Shampoo or other household chemical are generally considered as non-toxic or mildly toxic agent which is intended for external use only to clean the hair, body or to treat certain diseases. In Chan T et al reported poisoning cases due to household chemicals. He noted the percentage of agents involved in poisoning was "Dettol" liquid (46%), cleaning products (19%), pesticides (14%), and shampoos (10%). (5) This kind of reporting is missing in India scenario.
The most common deleterious effects of modern cosmetics are occasional allergic reactions and contact dermatitis (6) Brand R et al report a patient with widespread dermatitis caused by contact allergy to Kathon CG and cocamidopropyl betaine in used in shampoo. (7)

Hui Han et al noted in his case report of shampoo ingestion that shampoo led to the osmotic pressure rise in the gastrointestinal tract, which in turn resulted in diarrhoea and vomiting. Substantial body fluid loss resulted in hypovolemic shock. (8) Wax PM et al reported a fatality associated with the inhalational exposure to a pyrethrum shampoo causes sudden irreversible bronchospasm. (9)

Two children were admitted to the paediatric intensive care unit due to organophosphate acetylcholine esterase inhibitor poisoning after exposure from a home-made shampoo that was used for the treatment of head lice. (10)

Differ from these case report we noted a death due ingestion of shampoo. Shampoo when rinsed on hair it will produce copious amount of froth with thick bubbles which do not get easily burst and to get rid of them we have to use ample of water. So if anybody ingested the shampoo it will cause thick layer all over oesophagus and when it will come in contact with any other liquid such as gastric lavage fluid or water it produces thick column of froth. One of the reason for fatality in the above stated case may be aspiration of this thick mucus. Or another reason may be hypovolemic shock due to thick viscous liquid ingestion followed by passive flooding of tracheal lumen with froth in peri-mortem or in agonal period.

Reference