



## Case Report

# Acute Matchstick Head Poisoning In Children With A Literature Review

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### Article Info

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### Abstract

In children, acute matchstick head poisoning occurs due to accidental ingestion while playing with match sticks. Toxicity depends on the number of matchstick heads ingested, ranging from less severe GI (gastrointestinal) symptoms to more severe toxic effects like hemolysis, respiratory failure, renal failure, and liver damage.

**Keywords:** matchstick head, poisoning, children

### Introduction

Match sticks are made out of wood or cardboard coated with ignitable materials on the tip. The match tip is struck across a suitable surface to ignite the match. Matches are Typically packaged in books of 20 cardboard sticks or boxes containing varying quantities of wooden sticks. Strike anywhere matches (sometimes called friction matches) and safety matches (sometimes called strike-on-box matches) are the two main classifications based on the required strike surface.[1] Strike-anywhere matches can be ignited by striking the tip on various hard, rough, dry surfaces such as rock, brick, or hardened concrete. When struck against a specifically prepared surface, safety matches will only ignite, usually found on the matchbook or box.

Although fatal fires have happened when children play with matches, the main toxic

concern involves swallowing the match tip. The wood or cardboard stick is generally considered non-toxic, although it could be a choking hazard. Toxic effects can occur with most chemicals on a match tip, but potassium chlorate and potassium dichromate are the most concerning substances. [1]

Acute matchstick head poisoning is rare in children and primarily accidental; they present with less severe effects. Only 2% of children with acute matchstick head poisoning develop few gastrointestinal symptoms.[2]

We report accidental acute matchstick head poisoning in a one-year-old child who recovered without complications.

### Case details

A previously healthy one-year-old child with average growth and development came to our casualty with a history of accidental ingestion of match stick heads-four in number at home while playing with match sticks.

At admission, the child was stable; his vital parameters were within normal limits, afebrile, and he had no GI symptoms. His investigation includes blood cell count with peripheral smear, renal function test, liver function test, serum electrolyte, PT, aPTT and urine routine were within normal limits. The child was monitored for three days, and he recovered without any complications.

### Discussion

Matchstick heads are typically composed of 45-55% potassium chlorate (KClO<sub>3</sub>) with a little sulfur, 20-40% siliceous filler, diatomite, glue and starch as a neutraliser (ZnO or CaCO<sub>3</sub>).[2]

Potassium chlorate is a highly reactive and toxic agent used in matchstick heads. Chlorates are toxic substances when ingested or inhaled. Ingestion of potassium chlorate results in rapid oxidative destruction of red blood cells, possibly followed by increased methemoglobin, cyanosis, and progressive renal failure.[3]

The estimated lethal dose ranges between 1gm in infants to 5gms in older children. Still, it seems that toxic effects are accumulative because of slow excretion of the chlorate ion and repeated 1gm ingestions.[4] For children, swallowing a few match tips generally causes minor gastrointestinal symptoms such as irritation to the mouth or throat, nausea, vomiting and diarrhoea. These effects are well tolerated unless vomiting and diarrhoea are severe and lead to dehydration. Obviously, if the match tip is still hot, a burn on the lip or in the mouth might occur.

Severe toxicity from swallowing matches can happen in young children who consume more than 12 strikes-anywhere matches or more than 20 safety matches. One of the toxic effects of significant ingestion of matches is hemolysis. In addition to respiratory failure, damage to the kidney and liver can occur.[1] In a unique situation of a pregnant woman with cautoxyreophagia, her newborn daughter showed toxic effects of exposure to the chemicals from the matches. The newborn had hemolysis and signs of liver injury. She required treatment in a hospital for eight days.[5] In the literature, a 3-year-old boy, after ingesting a 40 match stick head, developed oliguric acute renal failure (ARF) requiring peritoneal dialysis for nine days. Renal biopsy showed acute tubulointerstitial nephritis. The child recovered completely without complication.[6]

The treatment for ingestion of match heads is to rinse and spit with water to remove any remaining material found in the mouth, drink a few sips of water and watch for dehydration if vomiting or diarrhoea occurs. No specific antidote is available.

## Conclusion

Matchsticks should be kept away from children. Parents and the general public to be educated about the toxic effects of matchstick head ingestion. Children with toxic or repeated ingestion of the matchstick head should be monitored and investigated for hemolysis, acute renal failure and liver injury.

**Conflicts of interest/Competing interests:** None

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