Clinical Guideline

CAUSTIC INGESTION

SETTING	Primary and Secondary Healthcare Institutions in the Western Cape which refer to Red Cross War Memorial Children's Hospital (RCWMCH)
FOR STAFF	Primary and Secondary Doctors and Nurses who refer patients to RCWMCH
PATIENTS	Patients under the age of 13 years old with caustic ingestion

Introduction

Ingestion of caustic substances can cause significant morbidity and mortality in children. The ingestion is most often accidental in the paediatric population and is a common presentation in the context of children in the Western Cape.

The purpose of this guideline is to assist primary and secondary healthcare workers in the assessment, initial management and referral of patients following caustic ingestion.

Background

Caustic agents are either acidic (pH<2) or alkali (pH>11.5). These agents cause chemical burns to the oropharynx, airway, oesophagus and sometime even the stomach. This damage to the aerodigestive and proximal gastrointestinal tract can lead to airway compromise, dysphagia, perforation or bleeding in the short-term. In the long-term, strictures (narrowing) of the tracts can have a lasting ongoing negative impact. In extreme cases, complex oesophageal replacement surgery is required to allow swallowing for food and saliva.

Airway injury and perforation can cause immediately life-threatening complications. Children with these complications need to be aggressively resuscitated and stabilised. In children with less acute symptoms, it is still essential that they undergo observation and investigation. This is to exclude or grade their injuries and anticipate the need for ongoing management to minimise the risks of delayed perforation or stricture down the line.

Teaching families about safe practises to prevent caustic ingestions such as keeping caustic substances out of reach of children, child safe caps and avoiding the use of cooldrink bottles for storage are extremely important in avoiding these injuries from happening in the first place.

The most common agents that cause caustic burns are household cleaning and hair products. Although industrial cleaning products are less commonly available, they tend to be highly caustic and can cause catastrophic injuries. The risk of ingestion is much higher if substances have been decanted into unmarked bottles that look like they contain juice or water.

Important details on history

Is there a history of witnessed ingestion?
- Who witnessed it?
- When did it occur?
- What agent was consumed?
- How much was consumed?

- What attempts at first aid were attempted before presentation?

Is it possible that there has been an unwitnessed ingestion?
- Was the child alone?
- Did the child have access to a caustic agent?

Is the patient refusing to eat or drink?

Important details on examination

Are there chemical burns to the face, neck or chest?

Are there chemical burns to the inside of the mouth and throat?

Are there signs of airway injury?
- Voice changes
- Stridor
- Dyspnoea
- Tachypnoea

Are there signs of oesophageal injury?
- Drooling
- Dysphagia
- Reluctance to eat or drink

Are there signs of mediastinitis (due to perforation)?
- Retrosternal or abdominal pain
- Fever, tachycardia and signs of sepsis
- Hypovolaemia or septic shock

Are there signs of gastric injury?
- Epigastric pain or tenderness
- Peritonism
- Sepsis
- Haematemesis (vomiting blood)

Emergency management

DO NOT EVER INDUCE VOMITING FOLLOWING CAUSTIC INGESTION

Children with complications of ingestion require immediate aggressive resuscitation:
- Airway management in cases of respiratory complications & distress due to aspiration or infection
- Fluid & blood product administration in cases where the patient is dehydrated or haemodynamically unstable due to blood loss
- Initiation of antibiotic therapy in cases where there is established sepsis

Observation for 12 to 24 hours after caustic ingestion is mandatory, even in asymptomatic patients

Investigation: Erect chest x-ray
- Screen for pneumomediastinum
- Screen for pneumoperitoneum
- Assess lung fields for evidence of aspiration

Referral guidance

The following groups should all be referred for urgent paediatric surgery assessment:
- All patients with clear evidence of caustic ingestion, even if asymptomatic.
- All patients with oropharyngeal burns suggesting possible caustic injury even if ingestion was not witnessed
- All patients with respiratory, GIT or systemic symptoms after possible caustic ingestion

Patients who are asymptomatic AND have no clear evidence of ingesting of a caustic substance can be observed until 12 hours post the possible ingestion. IF they remain completely asymptomatic, then assume no ingestion and no referral in needed. Patient can be discharged home after this period with clear parental counselling to prevent future ingestions.

Parental counselling

Specifically counsel families regarding the dangers of storing household cleaning products & other caustic agents within reach of small children and of decanting & storing these agents in unmarked or inappropriate containers, such a cooldrink bottles

All caustic ingestions are assumed to have caused serious injury until proven otherwise. Most patients will end up having mild injuries but may require several days of intravenous hydration or nasogastric feeds until they are able to swallow again.

Severe injuries may result in oesophageal burns with necrosis and strictures (narrowing). These patients may require a longer in-hospital stay and may also require multiple future procedures to manage these strictures. The goal of treatment will be to ensure adequate nutrition & restore oesophageal functionality as best as possible.

Patients with signs of airway compromise will often be intubated to keep their breathing safe while the burn has a chance to settle down. Severe airway burns sometimes require tracheostomy but this is rare.

Once the patients have been assessed by paediatric surgery at RCWMCH they will undergo one or two procedures depending on their clinical picture:

1. Technetium-labelled sucralfate scan: This is a non-invasive screening tool which is useful to exclude oesophageal injury in patients who are asymptomatic. Patients with a negative sucralfate scan (no adherence of sucralfate to oesophageal mucosa) and feeding well do not require endoscopic assessment

2. Endoscopy: Flexible esophagogastroduodenoscopy is the gold standard in establishing the presence of injury & for grading the severity of the injury. This is done in all patients with any symptoms of dysphagia as well as asymptomatic patients with a positive sucralfate scan.

List of typical caustic agents

- Industrial detergents
- Drain cleaner
- Oven cleaner
- Hair relaxers
- Automatic washing machine detergents
- Dishwasher detergents
- Industrial peroxide preparations
    - Fabric stain removers

    - Hair dye
    - Disinfectants
    - Deodorisers
- Potassium permanganate crystals ('Condy's crystals')
- Lye
- 'Potash'
- Caustic soda
- Lime
- Whitewash
- Sodium phosphate
- Ammonium chloride solutions

<u>NOTE:</u> The following agents do not cause caustic injures but can cause harm. Patients who have ingested the agents below should be promptly discussed with a general paediatric unit for investigation and possible referral.

- Paraffin
- Petroleum
- Organophosphates and other pesticides
- Household bleach

The **24 HR POISON INFORMATION HELPLINE: 0861-555-777** is available for clinicians and members of the public to discuss any concerning ingestion of any substance and will give guidance on the best course of action.