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MANAGEMENT OF COMMON POISONING

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ABSTRACT

Cases of poisoning may be treated in many places, e.g. at the scene of the accident, during transport, in a hospital. The type of care that can be given will depend on whoever makes the initial contact with the patient and in what circumstances. Certain members of the community, such as firemen, policemen, and teachers, may frequently be the first to be faced with poisoning cases. In rural areas, nurses and primary health care workers, and even agronomists and veterinarians, may have to deal with poisoned persons. They all need at least some basic training in first aid as well as in decontamination and measures for their own protection. The treatment of poisoning by ingestion is as complex as is the enumeration of poisoning agents. There are, however, many practical and general principles that may be applied to any case in which a poison has been taken by mouth. The essence of treatment of any type of ingested poison is the often life saving procedure of emptying the stomach as quickly as possible. Unless the patient is comatose or in cases of poisoning due to petroleum distillates and corrosive agents, gastric lavage should be carried out in every instance. Where emesis is impossible, chemical antidotes may be administered in the lavage fluid. While specific treatment and supportive measures are of great importance, prevention through education is the basic means of avoiding these tragedies.

KEYWORDS: Accident, agronomists, veterinarians.

Management of common poisoning

Management of common poisoning patients concentrate on the following areas:

1. First aid in poisoning
2. Management of poisoning in emergency department
3. Prevention of poisoning

I. First Aid In Poisoning

Seek immediate medical help

For poisoning by swallowing

1. Drink small amount of water & milk immediately, before getting poison control assistance if the patient is conscious and the ingested product is irritating/burning.
2. Check and monitor the person's airway, breathing, and pulse. If necessary, begin rescue breathing and CPR.
3. Try to make sure that the person has indeed been poisoned. It may be hard to tell. Some signs include chemical-smelling breath, burns around the mouth, difficulty breathing, vomiting, or unusual odors on the person. If possible, identify the poison.
4. DO NOT make a person throw up unless told to do so by poison control or a health care professional.
5. If the person vomits, clear the person's airway. Wrap a cloth around your fingers before cleaning out the mouth and throat. If the person has been sick from a plant part, save the vomit. It may help experts identify what medicine can be used to help reverse the poisoning.
6. If the person starts having convulsions, give convulsion first aid.
7. Keep the person comfortable. The person should be rolled onto the left side, and remain there while getting or waiting for medical help.
8. If the poison has spilled on the person's clothes, remove the clothing and flush the skin with water.

For inhalation poisoning

Call for emergency help. Never attempt to rescue a person without notifying others first. If it is safe to do so, rescue the person from the danger of the gas, fumes, or smoke. Open windows and doors to remove the fumes.

1. Take several deep breaths of fresh air, and then hold your breath as you go in. Hold a wet cloth over your nose and mouth.
2. DO NOT light a match or use a lighter because some gases can catch fire.

3. After rescuing the person from danger, check and monitor the person's airway, breathing, and pulse. If necessary, begin rescue breathing and CPR.
4. If necessary, perform first aid for eye injuries or convulsion first aid.
5. If the person vomits, clear the person's airway. Wrap a cloth around your fingers before cleaning out the mouth and throat.
6. Even if the person seems perfectly fine, get medical help.

For poisoning on the skin

1. Take off clothes that have poison on them. Wash these clothes separately.
2. Rinse the skin very well with water. Then wash the skin gently with soap and water.
3. Call the poison centre/physician/hospital.

For poisoning in the Eye

1. Remove contact lenses if worn.
2. Rinse the eyes with water for 15 minutes. Open and close the eyes while rinsing.
3. Call the poison centre/physician/hospital.

Do Not

1. Give an unconscious person anything by mouth.
2. Induce vomiting unless you are told to do so by the Poison Control Center or a doctor. A strong poison that burns on the way down the throat will also do damage on the way back up.
3. Try to neutralize the poison with lemon juice or vinegar, or any other substance, unless you are told to do so by the Poison Control Center or a doctor.
4. Use any "cure-all" type antidote.
5. Wait for symptoms to develop if you suspect that someone has been poisoned.

II. Management of Poisoning In Emergency Department

Management of poisoning in ED focuses on:

1. Emergency stabilisation and supportive care.
2. Reducing further absorption of the toxin.
3. Using a specific antidote, if one exists.
4. Increasing elimination of the toxin.
5. Treating effects of the toxin.

1. Emergency stabilisation and supportive care

- The first priority in the nursing management of common poisoning patients is the maintenance of ABC (airway, breathing and circulation).
- The four possible aetiologies (hypoxia, opioid intoxication, hypoglycaemia and Wernicke's encephalopathy) of poisoning should be treated with:

i. IV Naloxone- 2mg in adults and 0.1mg/kg in children.
ii. IV Dextrose- 50ml of 50% solution for adults & 2-4ml/kg of 25% solution for children.
iii. IV Thiamine- 100mg for adults.
iv. IV fluids- If IV fluids are ineffective then vasopressor like norepinephrine 0.5-1mg/minute as IV infusion.
v. Supplemental oxygen.

2. Reducing further absorption of the toxin

i. Topical decontamination

- Anybody surface (including the eyes) exposed to a toxin is flushed with large amounts of water or saline.
- Contaminated clothing, including shoes and socks, and jewellery should be removed. Topical patches and transdermal delivery systems are removed.

ii. Orogastric lavage- The nursing officer should ensure that:

- Indications for orogastric lavage procedure are generally limited to recent ingestion of a life-threatening toxin that requires ventilatory support because of depressed mental status, or risk of seizures.
- Clinical efficacy of lavage is achieved only if it is initiated with in 1 hour of toxic ingestion.
- Patient is positioned in the left lateral decubitus position.
- Largest tube 36-40 French tube is used for adults & 22-24 French tube is used for children.
- 25gm of activated charcoal is given immediately after insertion.
- The lavage is provided with water (500-3000ml) on room temperature until the withdrawn fluid becomes clear.
- Lavage is not provided to the patients who had ingested pills that are known not to fit into the holes of the orogastric lavage tube, nontoxic ingestions, non-life-threatening ingestions, caustic ingestions, any patient whose airway integrity is not assured, or toxic ingestions that are more damaging to the lungs than to the GI tract.

iii. Activated charcoal- The nursing officer should ensure that

- Most appropriate agent to decontaminate the GI tract is the activated charcoal.
- Charcoal is indicated for substances which adsorb to it whereas Charcoal is not indicated for substances which do not adsorb to it like lead, cyanide, iron, other metals, lithium poisoning.
- It is given with water or juices by mouth or through orogastric tube.
- Dose is 10-25gram for children < 5years and 50-100gram for older children and adults.
- Activated charcoal should not be given if oesophageal or gastric perforation are suspected, or if emergency endoscopy might be needed.
- One dose of activated charcoal is usually sufficient to achieve a therapeutic effect.
- Multiple-dose activated charcoal is usually given as follows: the first dose is up to 1 g/kg body weight, which is then followed by subsequent doses of 0.25

to 0.50 g/kg. Repeated doses of activated charcoal should be given in intervals ranging from 1 to 4 h.

iv. Whole bowel irrigation- The nursing officer should ensure that:

- Irrigation is indicated for any of the following:
- Some serious poisonings due to sustained-release preparations or substances that are not adsorbed by charcoal (eg, heavy metals).
- Drug packets (eg, latex-coated packets of heroin or cocaine ingested by body packers)
- Solution of polyethylene glycol and electrolytes is given at a rate of 1 to 2 L/h for adults or at 25 to 40 mL/kg/h for children until the rectal effluent is clear; this process may require many hours or even days. The solution is usually given via a gastric tube, although some motivated patients can drink these large volumes.
- Contraindications include: patients with preceding diarrhoea; and patients with absent bowel sounds or with obstruction.
- Patient may develop bloating, cramping, and rectal irritation from frequent bowel movements therefore Close nursing care is needed to maintain patient cleanliness.

3. Increasing elimination of the toxin

i. Alkaline diuresis- The nursing officer should ensure that:

- Alkaline diuresis is contraindicated in patients with renal insufficiency.
- Urine alkalinization may be considered for agents that are excreted as weak acids in the urine. By alkalinizing the urine through use of intravenous sodium bicarbonate, these weak acids will remain in a more polar ionized form in the urine that limits reabsorption and enhances elimination.
- Urine alkalinization may be considered for chlorpropamide, 2,4-dichlorophenoxyacetic acid, diflunisal, fluoride, methylchlorophenoxypropionic acid, methotrexate, phenobarbital and salicylates
- A solution made by combining 1 L of 5% D/W with 3 50-mEq ampules of $NaHCO_3$ and 20 to 40 mEq of K can be given at a rate of 250 mL/h in adults and 2 to 3 mL/kg/h in children.
- After intravenous administration, bicarbonate becomes concentrated in the urine resulting in significant elevation of urinary pH (if the patient has a normal serum potassium). By significantly raising the urinary pH with intravenous sodium bicarbonate, toxins that are weak acids are converted from their nonionized form to their ionized form and are therefore held within the urinary collection system. This "ion trapping" keeps the toxin within the renal tubules, thereby enhancing its excretion out of the body in the urine.

ii. Dialysis

- Haemodialysis is generally reserved for specific toxins that are potentially life-threatening. Examples of agents that are commonly encountered and may require dialysis include common poisonings where dialysis may be indicated include alcohols, lithium, salicylates (aspirin), metformin, acetaminophen, valproic acid, phenytoin, barbiturates, carbamazepine, theophylline.
- Other common poisonings in which dialysis is not indicated include Hydrocarbon Poisoning, Anticholinergic Poisoning, Chronic Arsenic Poisoning, Carbon Monoxide Toxicity, Cyanide Poisoning, Lead Poisoning in Children, Opioid Overdose, Tricyclic Antidepressant Poisoning.
- The benefits include the ability to remove toxins that are already absorbed from the gut lumen, removal of substances that do not adhere to activated charcoal, and the ability to remove both the parent compound and the active toxic metabolites.
- Haemodialysis is much less effective when the toxin ingested has a large volume of distribution (>1 L/kg), has a large molecular weight (more than 500 Da), or is highly protein bound.

4. Using a specific antidote, if one exists.

Antidotes

Agent or Clinical Finding	Potential Antidote(s)
Acetaminophen	N-acetylcysteine
Benzodiazapines	Flumazenil
Beta blockers	Glucagon
Cardiac glycosides	Digoxin immune Fab
Crotalid envenomation	Crotalidae polyvalent immune Fab
Cyanide	Hydroxocobalamin
Ethylene glycol	Fomepizole
Iron	Deferoxamine
Isoniazid	Pyridoxine
Lead	Succimer Dimercaprol Calcium ethylenediamine tetra-acetic acid
Methanol	Fomepizole
Methemoglobinemia	Methylene blue
Monomethylhydrazine Mushrooms	Pyridoxime
Opioids	Naloxone
Organophosphates	Atropine Pralidoxime
Sulfonylureas	Glucose Octreotide

5. Treating effects of the toxin

- In ICU careful vital monitoring to be done to observe the effects of toxins and to be treated promptly.

III. Prevention of Poisoning

Storage

1. Store all medicines and chemicals out of reach and out of sight of children (at least 1.5m high), in a locked or child-resistant cupboard.
2. Keep poisons in their original containers. Never transfer poison to drink or food containers.
3. Always store medicines separately from household cleaning products.
4. Only buy household products and medicines in child-resistant packaging. Check that the child resistant closure is working correctly. You may need to clean around the neck of the container.
5. Do not leave medications such as the contraceptive pill on a bedside table.

6. Place empty medicine or cleaning bottles into an outside bin immediately – many poisonings occur when children access containers from the kitchen bin.
7. DO NOT store household chemicals in food containers, even if they are labeled. Most nonfood substances are poisonous if taken in large doses.

Medicines

1. Always read and follow the directions for use.
2. Always take medicines in a well lit room.
3. Do not take other people's medicines.
4. Children tend to imitate adults, so avoid taking medicines in their presence.
5. Refer to medicines by their proper names. They are not lollies.
6. Visitor's bags may contain medicines. Store them out of reach of children.
7. Keep medicines that require refrigeration in a tightly closed or locked container at the back of the fridge.
8. Clean out your medicine cupboard regularly. Take unwanted or out-of-date medicines to your nearest pharmacy for disposal.

Other risks around the home

1. Always follow instructions when using chemicals and cleaning products. For example, when painting, spraying weeds or cleaning the oven, protect your skin, eyes and airways. Ensure there is good air circulation.
2. Button batteries can cause life-threatening injuries if swallowed. Check the battery compartments on devices and toys are secure, and lock away spare batteries.
3. Supervise children when using toys or devices containing button batteries. If you suspect a child has swallowed a battery, go to the nearest hospital immediately. Do not let the child eat or drink. Do not induce vomiting.
4. Be aware of the plants in your garden and remove any that are known to be poisonous. Look out for mushrooms and other fungi, especially after rain. If someone is exposed to a poisonous plant, follow the advice in this fact sheet. Collect a sample (if safe to do so) and take a photo for possible later identification.

Some points to remember

1. The risk of poisoning increases when usual daily routines are disrupted. For example, when moving house, going on holiday, having visitors or household illnesses.
2. Many poisonings occur when a product or medicine is not in its usual location. For example, when in use and left on a bench top or bedside table, or during transport from the shop to home.
3. Take extra care to supervise children when visiting other households and businesses – they may not have medicines or other poisons stored safely.

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