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Review Article

MANAGEMENT OF POISONING: BASICS TO BEYOND

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ABSTRACT

Poisoning is a common cause of morbidity and mortality with acute medication poisonings counting almost for nearly one half of all poisonings. In spite of advanced knowledge regarding the management of poisoning their pharmacokinetics and pathology, the general principles of treatment of a poisoned patient remain the same, only the difference has emerged in the fact that the traditional methods like gastric lavage, for example, have replaced with newer methods like use of activated charcoal and a variety of newer antidotes. Through, this paper we have tried to describe the change in the management of poisoning from basics to beyond.

Keywords: Poisoning, Gastric Lavage, Antidotes.

INTRODUCTION

Principles of management

The principles of management includes: Provision of supportive care, Prevention of poison absorption, Enhancement of elimination of poison and Administration of antidotes

I. Supportive care

The supportive care includes: First, the airway should be cleared of vomitus or any other obstruction and an oral airway or endotracheal tube inserted if needed. After that breathing should be assessed by observation and oximetry and if in doubt by measuring arterial blood gases patients with respiratory insufficiency should be intubated and mechanically ventilated. Finally, circulation should be assessed by continuous monitoring of pulse rate, blood pressure and urinary output. Then as a supportive care an intravenous line should be placed and blood drawn for serum glucose and other routine determinations Dextrose to treat hypoglycemia (0.5gm/kg)¹.

Followed by this proper history of the patient should be recorded that is if the person is conscious and immediately brought to the ED, history may be relevant. Mostly patient estimates of drug/ nature of substance ingested are inaccurate, thus should be taken care of.

II. Prevention of poison absorption

This includes:

1. Gastric Lavage:

It is useful if done before three hour of ingestion of a poison. It is done with water (except infants – NS), 1:5000 potassium permanganate, four percent tannic acid, saturated lime water or starch solution. Administering & aspirating 5ml/kg through a No. 40 F orogastric tube (No. 28 F – children) or Ewald's tube. The position of the patient should be Trendelenburg & left lateral position.

Complications of the gastric lavage are aspiration which is the commonest of, esophageal /gastric perforation, tube misplacement in the trachea. Its Contraindications are Corrosive poisoning that is GE perforation, petroleum distillate ingestants - Aspiration pneumonia, compromised unprotected airway, esophageal or gastric pathology or in cases of recent esophageal or gastric surgery².

Gastric lavage decreases ingestion of absorption by an average of 52 percent, if performed within 5 minutes of ingestion, 26 percent if performed at 30 minutes and 16 percent if performed at 60 minutes.

2. Ipecac Syrup Induced Emesis

This is used for home management of patients with Accidental ingestions. It is given if complete history is known and in cases of mild predicted toxicity. It is administered orally within the Dosages of 30 ml for adults, 15 ml for children and 10 ml in cases of small infants³.

Its works through the mechanism of action: As it irritates the stomach this in turn stimulates CTZ centre. This results in

vomiting occurs about 20 min after administration and dose may be repeated if vomiting does not occur.

Its contraindications are gastric / esophageal tears or perforation, corrosives, Central Nervous System depression or seizures and rapidly acting CNS poisons (cyanide, strychnine, camphor)⁴.

3. Activated Charcoal

These have greater efficacy and less invasive procedure. Given orally as a suspension (in water) or through NG tube. Its Dosage is 1 g/kg body wt. Its mechanism of action Charcoal adsorbs ingested poisons within gut lumen allowing charcoal-toxin complex to be evacuated with stool or removed by induced emesis or lavage. It is Indicated- Barbiturates, Atropine, Opiates, Digoxin, Theophylline. ⁵It's Contraindicated in mineral acids, alkalis, cyanide, iron, lithium, alcohol poisoning. Its Side effects are nausea, vomiting, diarrhoea or constipation. May prevent absorption of orally administered therapeutic agents.

4. Whole Bowel Irrigation

Administration of bowel cleansing solution containing electrolytes & polyethylene glycol. Orally or through gastric tube and End point- rectal fluid is clear. It is indicated in slow or enteric coated medications, Heavy metals, Iron, Lithium

5. Cathartics

They promote rectal evacuation of Gastro-intestinal contents. Most effective is Sorbitol. The Salts – Disodium phosphate, Magnesium citrate & sulfate, Sodium sulfate, Saccharides – Mannitol, Sorbitol . but they have disadvantages like Abdominal cramps, nausea, vomiting ,excessive diarrhoea, Hypermagnesemia.

III. Enhancement of Elimination of Poison

Extra Corporeal Removal

1. Dialysis

Barbiturates, Ethanol, Ethylene glycol, Salicylates, Lithium, Less effective when, toxin has large volume of distribution (less than 1 L/kg), has large molecular weight, highly protein bound.

2. Peritoneal Dialysis

It is done with alcohols and lithium

3. Exchange transfusion

It is done in cases like: Fatal, irreversible toxicity, Deteriorating despite aggressive supportive therapy, Dangerous blood levels of toxins or in cases of Liver or renal failure. For example: Arsine or Sodium Chlorate poisoning⁶.

4. Chelation

It is done in cases of Heavy metal poisoning. Its mechanism of action involves formation of complex of agent and metal which is water soluble and then it is excreted by kidneys. Different chelating agents involve BAL used in Arsenic, Lead, Copper, Mercury poisoning. EDTA used in Cobalt, Iron, Cadmium poisoning. Desferrioxamine used in Iron poisoning. DMSA used in Lead, Mercury poisoning.

5. Antidotes

The use of antidotes is newer technique used as enhancement of elimination of poison⁷⁻¹⁰. This is described in Table: 1

POISON	ANTIDOTE
Acetaminophen	N - acetylcysteine
Benzodiazepine	Flumazenil
Anticholinergics	Physostigmine
Opioid	Naloxone
Cyanide	Thiosulphate , nitrite
Iron	Desferrioxamine
OP Poisoning	Atropine , Oximes

CONCLUSION

General Physicians should take a active role in the emergency management of poisoning, which includes early decontamination and antidote treatment. And most patients will return to society with minimal disability with the early use of appropriate gut decontamination methods, proper use of antidotes, and better supportive care, and finally the risk of mortality from poisoning will greatly decreased.

REFERENCES

- Henry K, Harris CR. Deadly ingestions. *Pediatr Clin North Am.* 2006; 53(2): 293–315.
- Ford MD. *Clinical Toxicology.* Philadelphia, Pa.: Saunders; 2001.
- Erickson TB, Thompson TM, Lu JJ. The approach to the patient with an unknown overdose. *Emerg Med Clin North Am.* 2007;25(2):249–281.
- Chyka PA, Seger D, Krenzelok EP, et al., for the American Academy of Clinical Toxicology, European Association of Poisons Centres and Clinical Toxicologists. Position paper: single-dose activated charcoal. *Clin Toxicol (Phila).* 2005; 43(2): 61–87.
- Vale JA, Kulig K, for the American Academy of Clinical Toxicology, European Association of Poisons Centres and Clinical Toxicologists. Position paper: gastric lavage. *J Toxicol Clin Toxicol.* 2004; 42(7): 933–943.
- Bateman DN. Gastric decontamination—a view for the millennium. *J Accid Emerg Med.* 1999; 16(2): 84–86.
- American Academy of Pediatrics Committee on Injury, Violence, and Poison Prevention. Poison treatment in the home. *Pediatrics.* 2003; 112(5): 1182–1185.
- Silber TJ. Ipecac syrup abuse, morbidity, and mortality: isn't it time to repeal its over-the-counter status. *J Adolesc Health.* 2005; 37(3): 256–260.
- Rowden AK, Norvell J, Eldridge DL, Kirk MA. Acetaminophen poisoning. *Clin Lab Med.* 2006; 26(1): 49–65.
- White ML, Liebelt EL. Update on antidotes for pediatric poisoning. *Pediatr Emerg Care.* 2006; 22(11): 740–746.

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