

A Review on Use of Antidotes

P. Sree Mahalakshmi

Narayana Pharmacy College, Nellore, A.P., India

Abstract: Antidotes can be used to prevent the absorption of poisons, to enhance their elimination, and to counteract their effects. With modern resuscitation techniques and intensive care, some patients can recover fully. The use of certain antidotes may seem unnecessary and the majority of the antidotes considered as adjuncts to supportive care. In certain circumstances, however, antidotes significantly reduce the need for medical interventions. These type of cases are especially important in rural and under-developed areas where the facilities are not readily available. In these conditions the antidotes may be considered as an life saving pharmaceuticals. Hence if a well equipped antidote bank is always available in the tertiary hospitals.

Keywords: Antidotes, Poisoning, Cyanide, Supportive care, Treatment

1. Introduction

Poisoning is a worldwide problem which results in significant morbidity and mortality. Antidotes are the therapeutic agents intended to modify or counteract with the clinical effects of particular toxic substances in the human body. The optimal treatment for poisoning depends on the availability of appropriate antidote in adequate quantity and at the appropriate time after poisoning. Depending on the poison, delayed use or unavailability of an antidote may lead to several problems like respiratory insufficiency due to organophosphate poisoning, blindness from inadequate treatment of methanol poisoning, renal failure from insufficient treatment of ethylene glycol poisoning and anoxic brain injury or death from lack of treatment of cyanide poisoning.

Antidotes administration based on time

- In some poison cases antidote should be administered within 30 minutes of poison ingestion. The antidotes which are administered in less than 30 minutes are Atropine, β -blockers, Calcium gluconate, Cyanide antidote kit, Dantrolene, Diazepam, Digoxin immune FAB, Glucagon, Glucose, Fomepizole, Methylene blue, Naloxone, Oxygen, Phentolamine, Physostigmine, Protamine, Pyridoxine and sodium nitro prusside.
- Some antidotes are administered within 2 hours after the ingestion of poison like N-acetyl cysteine, Deferoxamine, Dimercaprol, Flumazenil, Neostigmine, Pralidoxime.
- Since the timely used antidotes is life saving in certain poisonings, it is the duty of the every hospital to keep available stock of the antidotes.^[1]

Antidotes and their use:

Treatment of poisoning mainly involves providing supportive care to the patient, although a number of antidotes are available for certain circumstances.

Antidotes play a crucial role in the management of certain poisons but they are available only for a smaller number of drugs and chemicals.

There were no nationally recognized guidelines for emergency departments on stocking antidotes or on how to access them. In June 2006, the British Association of Emergency medicine (BAEM) produced the first such

guidelines in conjunction with Guys and St. Thomas poisons unit. These guidelines help hospitals to ensure that the appropriate antidotes are held in the appropriate areas of the hospital in sufficient quantities. In the guidelines agents are grouped in to four categories depending on the urgency of the clinical need. This may be:

- Immediate
- Within one hour
- Within four hours
- Not critically time dependent.^[2]

BAEM guidelines for the management of pain in adults:

Pain management is one of the most important components in patient care, which is given such as high priority in the BAEM " clinical standards for A and E Departments" and the national triage scale.

Pain is commonly under treated and treatment may be delayed.

The BAEM clinical effectiveness committee standards of analgesia for moderate and severe pain within 20 minutes of arrival in A and E should be applied in all A and E Departments. An audit against these standards should be done annually. Training for all the staff involved in patient care is essential to ensure quality and timely management.

Pain Assessment

Pain assessment forms an integral part of the National triage scale. The experience of the member of the staff triaging will help in estimating the severity of the pain.

How to manage pain:

Patients in severe pain should be transferred to an area where they can receive appropriate intravenous or rectal analgesia within 20 minutes of arrival. Patients in severe pain should have the effectiveness of analgesia re-evaluated within 30 minutes of receiving the first dose of analgesia.

Patients in moderate pain should be offered oral analgesia.

Pain Scoring:

- 0 : No pain
- 1-3 : Mild pain
- 4-6 : Moderate pain
- 7-10: Severe pain.^[3]

Volume 8 Issue 5, May 2019

www.ijsr.net

Licensed Under Creative Commons Attribution CC BY

Over the several years survey conducted by World Health Organization (WHO) and also studies in various countries have demonstrated inadequate availability of antidotes. Since no such studies have been published for Indian hospitals, it was investigated the availability of antidotes in south Indian hospitals and to review the surveys conducted in different countries.

E.g.: A study conducted in hospitals at north Palestine was to determine the availability and adequacy of antidotes. The lists of antidotes to be stocked in different hospitals are based on the guidelines proposed by BAEM. The antidote stock is then compared to the American guidelines.

BAEM guidelines divided the antidotes in to two categories in which one should be available immediately and the one which should be available within four hours.^[4]

Expert consensus guidelines for stocking of antidotes in hospitals that provide emergency care:

Profile of antidote panel members:^[5]

Discipline or Specialty	No of Participants
Clinical pharmacology	1
Clinical Pharmacy	1
Critical Care Medicine	2
Emergency Medicine	7
Emergency Medical Services	1
Hematology / Oncology	2
Hospital Administration	2
Hospital Pharmacy	1
Medical Toxicology	6
Pediatric Critical care medicine	1
Pediatric Emergency Medicine	1
Poison Center Administration	2
Public Health	2

Antidotes List:

Recommended Minimum amounts for Hospital Pharmacies to Stock

Antidote	Poisoning Indication	Minimum Stocking Recommendations
Acetyl Cysteine	Acetaminophen	Oral: 120 grams IV : 96 grams
Antivenin, Snake	Crotaline Snake envenomation.	12 vials
Antivenin, black widow spider	Black widow spider envenomation.	1 vial
Atropine	Organophosphate and carbamate insecticides, nerve gases.	165 mg
Calcium chloride	Calcium channel blockers	10 grams
Calcium disodium EDTA	Lead	2.25 grams
Calcium gluconate	Hydrofluoric acid Calcium channel blockers	1 kg (powder) IV: 30 grams
Cyanide antidote kit	Cyanide	1 kit
Cyproheptadine	Serotonin syndrome	80 mg
Dantrolene	Neuroleptic malignant syndrome	720 mg
Desferal	Iron	8 grams
Dimercaprol (BAL)	Heavy metals	1.5 grams
Digoxin immune	Digoxin	20 vials

FAB		
DMSA	Heavy metals	2000 mg
Folic acid	Methanol	IV: 150 mg
Flumazenil	Benzodiazepines	10 mg
Fomepizole	Ethylene glycol, Methanol	12 grams
Glucagon	Calcium channel blockers	50 mg
Physostigmine	Anti-cholinergics	20 mg
Sodium thio sulfate	Cyanide	50 grams
Thiamine	Ethylene glycol	IV: 100mg
Protamine sulfate	Heparin	500 mg
Naloxone	Opioids	40 mg
Leucovorin	Methotrexate	IV: 200 mg

[6]

References

- [1] K. Nagaraju, Brinda, BK. Gopal. Antidote banks: Need of the day in the Indian scenario. J Punjab Acad Forensic Med Toxicol. 13(2):2013.
- [2] Poisoning antidotes and their use by Alison Dines, Paul Dargan, Stephen Nash.
- [3] British Association for Emergency Medicine, Churchill house.
- [4] K. Nagaraju, Brinda, BK. Gopal. Antidote banks: Need of the day in the Indian scenario. J Punjab Acad Forensic Med Toxicol. 13(2):2013.
- [5] Expert Consensus Guidelines For Stocking Of Antidotes in hospitals that provide emergency care by Richard C. Dart.
- [6] Antidote list by Maryland Poison Center, 2016.