

DRUG POISONING**Dr. Binay Gupta, Dr. Arpan Dutta Roy*, Dr. Arun Roy**

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ABSTRACT

Drug poisoning mainly refers to the condition of exposure of life to an overdose of either prescribed drugs or drugs that are brought over the counter. It can also be due to drug abuse or drug interaction. Some people may be more sensitive to certain medications so that the high end of therapeutics range of a drug may be toxic for them. Illicit drugs, used to get high, may be taken in overdose amounts when a person's metabolism cannot detoxify the drug fast enough to avoid unintended side effect.

KEYWORDS: Illicit drugs, drug abuse or drug interaction.**INTRODUCTION**

Drug poisoning describes the toxic effect due to the ingestion or application of a drug or other substance in quantities greater than recommended or generally practised. Reaction to a drug caused by an allergic sensitivity is not considered as drug poisoning. Worldwide, more than 9 million natural and synthetic chemicals have been identified, fewer than 3000 cause more than 95% accidental and deliberate poisoning. Virtually, all drugs, especially in larger doses or when taken over long periods of time, can initiate a toxic condition.

DRUG POISONING CAUSES

In many hospitals in the developed world, acute poisoning is one of the most common reasons for acute admission to a medical world , poisoning may be:

Deliberate: It can be

- 1) Self harm or suicide.
- 2) Child abuse or munchausen's syndrome by proxy(a behaviour pattern in which a care giver deliberately exaggerates or induces physical, psychological, behavioural or mental health problem in those who arein their care).
- 3) Third party, eg- homicide or illicit drugs.

ACCIDENTAL

- 1) In children
- 2) Dosage error by patient or doctor
- 3) Recreational use, eg- heroin, methadone and cocaine.

Occupational exposure

Environmental exposure: Eg- plants, food, stings and bites.

CLINICAL FEATURES

Drugs have effects on the entire body, generally in an over dose, the effects of the drugs may be a heightened use. Eighty percent of adult are conscious on arrival at hospital and the diagnosis of self poisoning is usually made from the history. In the unconscious patient a history from friends or relatives is helpful, and the diagnosis can often be inferred from tablets, bottles or a suicide notes brought by the ambulance attendants. Tablets identification may be helped by the use of TICTAC, a visual drug identification database with information and high-quality images on thousand of tablets, capsules and related products. The physical signs that may aid identification of the agent responsible for poisoning.

INVESTIGATION

A blood sample should be taken at an appropriate time post drug overdose if the following drugs are likely to have been taken: aspirin, digoxin, ethylene, glycol, iron, lithium, methanol, paracetamol or theophylline. The determination of the concentration of these drugs will be valuable in management. Drug screens of blood and urine are also occasional helpful in the seriously ill unconscious patient in whom the cause of coma is unknown. Further investigation depends on the drugs ingested and knowledge of their likely impact on metabolic and cardiorespiratory function and the clinical assessment of the patient, eg- arterial blood gases in the comatose patient.

Some physical signs of poisoning

Features	Likely poison
1) Constricted pupils	Opoids Organophosphate insecticides Nerve agent.

2) Dilated pupils	Tricyclic antidepressant Amphetamines Cocaine Antimuscarinic drugs
3) Divergent strabismus(deviation of eye that patient cannot overcome)	Tricyclic antidepressant
4) Nystagmus(involuntary movement of eye)	Phenytoin Carbamazepine
5) Loss of vision	Carbon monoxide Methanol
6) convulsion	Tricyclic antidepressants Theophylline Opioids Mefenamic acid Isoniazid Amphetamines
7) dystonic reaction	Metoclopramide Phenothiazides
8) Delirium and Hallucinations	Antimuscarinic drugs Amphetamines Cannabis Recovery from tricyclic antidepressant overdose
9) Hypertonia and Hyperreflexia	Tricyclic antidepressant Antimuscarinic drugs
10) Tinnitus and deafness	Salicylates Quinine
11) Hyperventilation	Salicylates Phenoxyacetate herbicides Theophylline
12) Hyperthermia	MDMA(estacy) 3,4-methylene dioxy-n-methylamphetamine
13) Blisters(small pockets of fluids within the upper layer of skin)	Usually occur in comatose patients
14) Lips and skin 'cherry red'	Carbon monoxide poisoning.

MANAGEMENT

Most patients with self poisoning require only general care and support of vital system. The following principles should be applied for the management of patients with self poisoning.

- 1) Emergency resuscitation
- 2) Prevent further drug absorption
- 3) Increase drug elimination
- 4) Administration of specific drug antidotes
- 5) Psychiatric assessment

1) Emergency resuscitation

- Nurse the patient in the left lateral position to reduce the risk of aspiration.
- clear the airway and intubate if the gag reflex is absent.
- administer 60% oxygen by face mask in patients not intubated.
- artificial ventilation is sometime necessary if ventilation is inadequate.
- measure temperature with a low-reading thermometer and treat hypothermia.

2) Prevent further drug absorption

- These measures are reserved for those who have taken a potentially serious(life threatening) overdose by mouth.
- Gastric lavage is rarely used due to the risk of complications and only if the procedures can be undertaken within 1hr of ingestion. 200-300ml of warm water or 0.9% saline are repeatedly instilled and aspirated from the stomach via a large bore orogastric tube with the patient in the left lateral decubitus position. It is contraindicated if the airway is not protected or overdose of corrosive, petrol or paraffin taken.complication include pulmonary aspiration and oesophageal perforation.
- Activated charcoal(50g orally) absorbs unabsorbed poison still present in the gut. It is given if the patient has ingested a drug absorbed by charcoal(eg- aspirin, digoxin, paracetamol, barbiturates) up to 1hr previously.
- Whole bowel irrigation is orally for potentially toxic ingestions of iron, lithium , sustained release or enteric coated drugs and ingested drug packets. Polyethylene glycol electrolyte solution, eg- klean-prep. Is infused via a nasogastric tube(1-2L/hr) until the rectal effluent is clear(usually 3-6hrs).

3) Increasing drug elimination

Multiple dose activated charcoal (50g 4-hourly until charcoal appears in the faeces or recovery occurs) interrupts the enterohepatic or enteroenteric recirculation. It is only used in patients who have ingested a life-threatening amount of carbamazepine phenobarbital, dapsone, quinine or theophylline.

- Urinary alkalinisation increases the urine pH and enhances the elimination of salicylates. It is rarely used now.
- Haemodialysis is used with severe lithium, ethanol, methanol, ethylene glycol and salicylate poisoning.

4) Antagonizing the effect of poison

- Specific antidotes are available for a small number of drugs

antidotes	Likely poison
100% oxygen or hyperbaric therapy (HBOT)	carbon monoxide poisoning and cyanide poisoning
Activated charcoal with sorbitol	used for many oral toxins
Adenosine	Theophylline antidote for adenosine poisoning
Atropine	organophosphate and carbamate insecticides, nerve agents, some mushrooms
Beta blocker	theophylline
Calcium chloride	calcium channel blockers, black widow spider bites
Calcium gluconate	hydrofluoric acid
Chelators such as EDTA, dimercaprol (BAL), penicillamine, and 2,3-dimercaptosuccinic acid (DMSA, succimer)	heavy metal poisoning
Cyanide antidote (amyl nitrite, sodium nitrite, or thiosulfate)	cyanide poisoning
Cyproheptadine	serotonin syndrome
Deferoxamine mesylate	Iron poisoning
Digoxin Immune Fab antibody (Digibind and Digifab)	digoxin poisoning
Diphenhydramine hydrochloride and benztropine mesylate	Extrapyramidal reactions associated with antipsychotic
Ethanol or fomepizole	ethylene glycol poisoning and methanol poisoning
Flumazenil	benzodiazepine poisoning
Glucagon	beta blocker poisoning and calcium channel blocker poisoning

antidotes	Likely poison
Insulin with Glucagon	beta blocker poisoning and calcium channel blocker poisoning
Leucovorin	methotrexate and trimethoprim
Methylene blue	treatment of conditions that cause methemoglobinemia
N-acetylcysteine	Paracetamol (acetaminophen) poisoning
Naloxone hydrochloride	opioid overdose
Octreotide	oral hypoglycemic agents
Physostigmine sulfate	anticholinergic poisoning
Phytomenadione (vitamin K) and fresh frozen plasma	warfarin poisoning and indanedione
Pralidoxime chloride (2-PAM)	organophosphate insecticides, followed after atropine
Protamine sulfate	Heparin poisoning
Prussian blue	Thallium poisoning
Pyridoxine	Isoniazid poisoning, ethylene glycol
Sodium bicarbonate	ASA, TCAs with a wide QRS ⁶

Psychiatric assessment

All patients with Deliberate self harm must be taken seriously and an assessment made of suicidal intent. In some patients, often young females, the act was not premeditated, they have no wish to die and the tablets were taken in response to an acute situation, eg- an argument with the girl friend/boy friend. The risk of suicide is low and formal psychiatric assessment is not always necessary. In the absence of potential medical problems these patients may not necessarily need to be admitted to hospital, provided there is the necessary social and emotional back up at home. In other patients there is clear suicidal note was written and effort was made not to be discouraged. These patients must be assessed by a psychiatrist before they leave hospital.

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