

B11Poisonings

Introduction

This is a very common clinical problem and accounts for a significant proportion of the work load in an A&E department. Rapid assessment, basic resuscitation and supportive care is essential. Try to get a collaborative history as to the time and quantity of drugs taken, this may involve talking to the family, ambulance crew and GP.

11.1 General principles

A: either the drug used or the accompanying alcohol can lead to airway problem due to a decrease level of consciousness. Aspiration is not uncommon in this group of patients. If the airway is at risk particularly if GCS<8 then get ITU opinion.

B: this may also be impaired due to the central hypoventilation stimulus caused by some drugs

C: dysrhythmias are common and may lead to haemodynamic compromise

Reducing drug absorption

1. Ipecac has no place in the management of overdose

2. Gastric lavage is unsuitable for those patients where there is a delay in presentation greater than 1 hr. Gastric lavage should be considered only if ALL the following are true:

- The overdose is life threatening.
- Fewer than 60 minutes have elapsed since the ingestion.
- The airway reflexes are intact or are protected.

The only absolute indication for gastric lavage is in the comatose patient who has cuffed endotracheal tube to protect the airway; the stomach contents should then be emptied via a lavage tube, followed by the installation of charcoal (if indicated). Do not attempt gastric lavage if a patient is actively unco-operative.

3. Charcoal

Activated charcoal has a very large surface area and high absorptive power. The dose depends on the amount of drug to be absorbed and the optimal ratio is about 10-1. It binds a large number of substances particularly those, which are not ionised and are not water soluble. Charcoal may be given as a drink to those patients awake enough to cooperate or may be instilled by a naso-gastric tube or gastric lavage tube. Repeated doses of charcoal may be useful in drugs that are known to undergo enterohepatic circulation. Other methods of decreasing drug absorption such as with cathartics eg Mannitol mixed with charcoal have no proven benefit and should be avoided.

Repeated doses of charcoal may be useful in life threatening overdoses of digoxin, theophylline, barbiturates, phenytoin, aspirin and carbamazepine

4. Whole bowel irrigation

The aim is to remove solid contents from the GIT by giving fluid down an NG tube until the effluent becomes clear. It may be useful for sustained release preparations and when the drug is not absorbed by charcoal such as with lithium and iron.

This is rarely needed and expert advice should be sought before commencing it.

Enhancing drug elimination

The best way of enhancing drug elimination is supportive therapy to optimise physiological elimination of drugs.

Forced alkaline diuresis for aspirin overdoses is not as beneficial as once thought. Care must be taken in giving fluids to the very elderly and in patients prone to heart failure (indication for a central line).

Haemodialysis is very rarely used. It is only of benefit for drugs that have a long half life and that are water soluble. It is more commonly used for overdoses that develop renal failure.

Other techniques such as haemofiltration, plasma exchange and exchange transfusion may have some specific applications but are not of proven scientific value.

11.2 Specific antidotes

The provision of supportive care is essential for all patients. Antidotes are available for only a few drugs and not always necessary. Further general and specific information is available from Toxbase

11.3 Admission and Psychiatric assessment:

Admission to ward 1 is indicated if the patient has taken an overdose that does not require active medical treatment or continuous monitoring. All other patients should be admitted under the medics if that is what is required.

ALL patients presenting with a drug overdose should have an evaluation by the psychiatric team. This may be done in the department at the time of attendance, on ward one if the patient has been admitted for observations or results of investigations, or on the medical ward if patient has been admitted for specific treatment. This evaluation should be done once the patient has had sufficient time to recover from the acute effects of the drug or alcohol.

If the patient refuses to be admitted and has no CAPACITY due to the effects of drug or alcohol then follow the algorithm shown

11.4 Notes on specific Drugs :-

Benzodiazepines

These are hypnotic/depressant drugs and are associated with prolonged unconsciousness (often taken in combination with alcohol). Their effects can be reversed by the use of Flumazenil, but this drug is absolutely contraindicated if there is a concomitant Tricyclic overdose, head injury, history of epilepsy or long term benzodiazepines abuse/treatment (as rapid reversal of benzodiazepines will cause convulsions). Flumazenil is given in small titrated doses iv to patients, until the respiratory effects are reversed, and the gag reflex restored (a fully conscious, agitated patient is not desirable).

Carbon monoxide

Carbon monoxide has x200 greater affinity for haemoglobin than oxygen. Organs that are more sensitive to oxygen deprivation like the heart and brain are at greater risk from carbon monoxide poisoning. Treatment consists of delivery of the highest possible concentration of oxygen. The indications for hyperbaric oxygen are persistent neurological symptoms and signs or carboxyhaemoglobin concentration greater than 20% (at any time). Note the PaO₂ may well be normal. Discuss the management with an A & E senior and ITU Consultant.

Digoxin

This is a complex drug with multiple cardiac effects. It has a large volume of distribution and quite long half life. Levels often creeps up insidiously in elderly patients with impaired renal function. Treatment includes correcting electrolyte abnormalities particularly hypokalaemia, which potentiates toxicity. Hyperkalaemia is a marker of severe toxicity. Brady arrhythmias should be treated by transcutaneous pacing. Tachyarrhythmias should be treated with intravenous phenytoin or betablocker (with care). In patients that require cardioversion this should be done very cautiously. Use the lowest possible energy setting on the defibrillator. Consider FAB digoxin antibodies for a severe life threatening poisoning.

Paracetamol.

The specific antidote for paracetamol is n-acetylcysteine. This should be started as soon as it is clear that a significant overdose has occurred. Its effectiveness deteriorates quickly with time.

Use the normogram shown to help with your decision

Indications to start n-acetyl cysteine in paracetamol intoxication in adults

If the level is near the treatment line err on the side of caution and treat with NAC; the stated time of ingestion may not be reliable.

Within 4 hours of ingestion:

Wait until 4 hours post ingestion before taking blood for level (keep patient in A & E for this).

Do NOT start NAC until the 4 hour post ingestion blood level is back.

Do NOT give methionine.

Do NOT give activated charcoal or lavage the stomach if the overdose is of paracetamol alone.

Between 4 and 7 hours after ingestion:

Take immediate blood level.

Start NAC **immediately** in A & E **only** if it is likely that a level will **not** be available sufficiently soon to start NAC within 8 hours of ingestion.

Otherwise start NAC if the level is above the treatment line.

Between 7 and 15 hours after ingestion:

Take **immediate** blood level.

Start NAC **immediately** in A & E unless amount taken is less than 75mg/kg during 24 hours.

Otherwise start NAC if the level is above the treatment line.

More than 15 hours after ingestion or if staggered overdose (ie tablets taken at different times):

Take **immediate** level, PT & U&Es (with ABGs if patient symptomatic).

NAC will be started **immediately** in A & E.

If > 75mg/kg ingested a full course of NAC should be given even if level is not above the “treatment line”.

Salicylate Now fairly uncommon, but as a result often mismanaged.>500mg/kg will cause serious or fatal toxicity

Signs &Symptoms suggestive of aspirin intoxication are

- tachypnea,
- tachycardia,
- sweating,
- dizziness,
- tinnitus,
- Nausea.

Management

Gastric lavage is useful if presenting with a large OD within 1 hr.

Administer charcoal if presenting with a large OD within 1 hr

Measure plasma Salicylate levels and ABG. Don't wait for 4 hrs before doing levels, but it would be wise to repeat, especially if done early and you're suspicious that the level is rising

ABG's usually show a mixed metabolic acidosis and respiratory alkalosis

Level	Treatment
<3.3mmol/L	Increase oral fluids
3.3-5.0mmol/l	IV fluids IV Na bic 1.26% (adults 500ml/hr for 3 hrs) To alkalis the urine to pH >7.5 Repeated doses of charcoal Repeat salicylate levels, U&E, ABG
>5.1mmol/l	Consider urgent referral for haemodialysis Correct acidosis Repeated doses of charcoal In life threatening OD with coma and severe Hyperventilation paralysis and IPPV may help.
Paracetamol	

Tricyclic Antidepressants

These are dangerous in overdose and must be taken seriously as the patient may deteriorate rapidly

Clinical features

- Hot dry skin
- Tachycardia
- Dilated pupils
- Dry mouth
- Urinary retention
- Ataxia
- Drowsiness
- Coma
- Hypertonia
- Respiratory depression
- Convulsions
- Cardiac arrest

ECG changes

Sinus tachy is most common but as severity increases then there is an increase in the PR,QT and QRS duration. There may be a tall R in aVr

In severe poisoning ventricular arrhythmias and bradycardia may occur.

Management.

A:

B:

C:

Observe continuously and monitor ECG as rhythm may deteriorate suddenly

- Consider gastric lavage if <1 hr particularly if the coma status requires a ET tube.
The drug is very well absorbed by charcoal and therefore this should be administered
- If fits occur give diazepam
- Most arrhythmias occur in unconscious patients within a few hrs of overdose. These are best treated by a correction of hypoxia and acidosis.
The best way to do this is either :
Sodium Bic 8.4%
Hyperventilation
Hypertonic saline

Alcohol

Use the ALCOMETER to estimate the blood alcohol if clouding of consciousness is present and alcohol poisoning is possible. However, do not dismiss the possibility of a co-incident head injury and therefore admit if in doubt. Alcohol is usually eliminated from the body at a rate of 30mg per hour.

11.5 Management of intravenous opiate poisoning

This guideline is not designed for use in the management of toxicity following *oral* ingestion of methadone. It is intended for use for adults who have opiate toxicity but no significant toxicity from other agents.

Recognition of intravenous opiate toxicity

Intravenous opiate toxicity should be suspected if any of the following features are found:

- Depressed conscious level.
- Improvement of conscious level following artificial ventilation or treatment with naloxone.
- Reduced respiratory rate.
- New injection sites.
- Personal account from the patient or a witness history.

The absence of pinpoint pupils does not exclude opiate toxicity.

Use of naloxone:

It may be more dangerous for a patient to leave with withdrawal symptoms than with intoxication.

Indications

Naloxone should be given if 3 or more of the following 5 criteria are met:

- GCS < 12.
- Respiratory rate < 6.
- Cyanosis.
- Evidence of IV drug abuse.
- Pin point pupils.

Dose:

200 microgram boluses should be used.

This small dose is suggested since the aims of treatment are to avoid hypoxia due to ventilatory failure without producing an acute withdrawal episode.

In patients who already have intravenous access the naloxone should be given intravenously; in patients without intravenous access naloxone should be given subcutaneously.

Titration

Further doses should be given at intervals of 2 minutes until the respiratory rate ≥ 6 , GCS ≥ 12 and there is no cyanosis or until 2mg have been given. ***If no there is no response to the first 800 microgram a middle grade or senior doctor should be called to review the patient.***

Observations

The following observations, as a *minimum*, should be made when the patient arrives at accident and emergency. The same observations should be repeated, as a *minimum*, every 15 minutes for two hours after arrival in accident and emergency or for two hours after the administration of naloxone. They should then be repeated as dictated by the patient's clinical progress. A normal value with pulse oximetry does *not* exclude significant hypoventilation if the patient is receiving supplemental oxygen.

- Assessment of the airway.
- Respiratory rate.
- Heart rate and blood pressure.
- Glasgow coma score.
- Temperature.
- Capillary glucose level (unless GCS = 15)

Discharge

In patients **who have not received naloxone**, discharge is safe 2 hours after arrival in A & E, providing *all* of the following criteria apply:

- Oxygen saturation \geq 92% (breathing room air).
- Respiratory rate 10 to 20.
- Temperature 35 to 37.5.
- Heart rate 50 to 100
- Glasgow coma score 15.

In patients who **have received naloxone** (from the ambulance crew, in A & E, or both), they should be observed for a further 2 hours *after* meeting the above criteria on three consecutive occasions (15 minutes apart).

Patients who have injected heroin as *an act of deliberate self harm* (i.e. not "recreational") should not be discharged until they have been reviewed by the deliberate self harm team. Such patients who take their own discharge before DSH team review should have CPN referral; **it is vital to make every effort to obtain biographical details.**

If patients are *not* competent to weigh the risks of taking their own discharge, they can be treated against their will if it is thought there is significant and immediate risk. In practice, however, this is difficult.

All patients should be given written and verbal advice on ways of reducing the risks intravenous drug abuse, and details of the facilities available to aid detox.

Admission

This is only necessary when an infusion of naloxone is needed. In such cases, the patient should be admitted to an area with high levels of nursing staff.

S Crane, S Davis, R Hardern, R Lewis, H McClelland, A Page: 1 October 1999
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