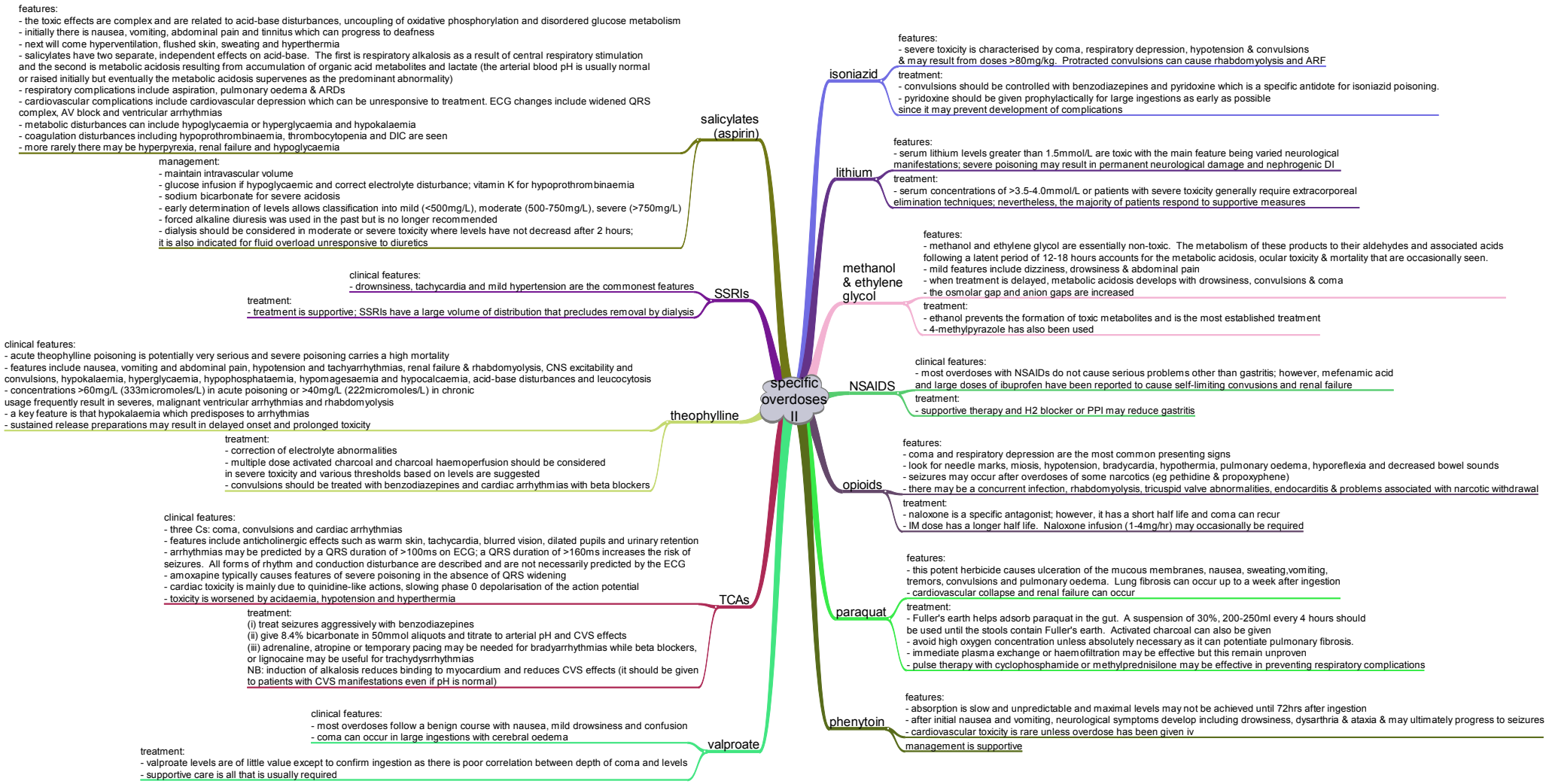
specific overdoses II
salicylates (aspirin)
features:
- the toxic effects are complex and are related to acid-base disturbances, uncoupling of oxidative phosphorylation and disordered glucose metabolism
- initially there is nausea, vomiting, abdominal pain and tinnitus which can progress to deafness
- next will come hyperventilation, flushed skin, sweating and hyperthermia
- salicylates have two separate, independent effects on acid-base. The first is respiratory alkalosis as a result of central respiratory stimulation and the second is metabolic acidosis resulting from accumulation of organic acid metabolites and lactate (the arterial blood pH is usually normal or raised initially but eventually the metabolic acidosis supervenes as the predominant abnormality)
- respiratory complications include aspiration, pulmonary oedema & ARDs
- cardiovascular complications include cardiovascular depression which can be unresponsive to treatment. ECG changes include widened QRS complex, AV block and ventricular arrhythmias
- metabolic disturbances can include hypoglycaemia or hyperglycaemia and hypokalaemia
- coagulation disturbances including hypoprothrombinaemia, thrombocytopenia and DIC are seen
- more rarely there may be hyperpyrexia, renal failure and hypoglycaemia
management:
- maintain intravascular volume
- glucose infusion if hypoglycaemic and correct electrolyte disturbance; vitamin K for hypoprothrombinaemia
- sodium bicarbonate for severe acidosis
- early determination of levels allows classification into mild (<500mg/L), moderate (500-750mg/L), severe (>750mg/L)
- forced alkaline diuresis was used in the past but is no longer recommended
- dialysis should be considered in moderate or severe toxicity where levels have not decreasd after 2 hours; it is also indicated for fluid overload unresponsive to diuretics
SSRIs
clinical features:
- drownsiness, tachycardia and mild hypertension are the commonest features
treatment:
- treatment is supportive; SSRIs have a large volume of distribution that precludes removal by dialysis
theophylline
clinical features:
- acute theophylline poisoning is potentially very serious and severe poisoning carries a high mortality
- features include nausea, vomiting and abdominal pain, hypotension and tachyarrhythmias, renal failure & rhabdomyolysis, CNS excitability and convulsions, hypokalaemia, hyperglycaemia, hypophosphataemia, hypomagesaemia and hypocalcaemia, acid-base disturbances and leucocytosis
- concentrations >60mg/L (333micromoles/L) in acute poisoning or >40mg/L (222micromoles/L) in chronic usage frequently result in severes, malignant ventricular arrhythmias and rhabdomyolysis
- a key feature is that hypokalaemia which predisposes to arrhythmias
- sustained release preparations may result in delayed onset and prolonged toxicity
treatment:
- correction of electrolyte abnormalities
- multiple dose activated charcoal and charcoal haemoperfusion should be considered in severe toxicity and various thresholds based on levels are suggested
- convulsions should be treated with benzodiazepines and cardiac arrhythmias with beta blockers
TCAs
clinical features:
- three Cs: coma, convulsions and cardiac arrhythmias
- features include anticholinergic effects such as warm skin, tachycardia, blurred vision, dilated pupils and urinary retention
- arrhythmias may be predicted by a QRS duration of >100ms on ECG; a QRS duration of >160ms increases the risk of seizures. All forms of rhythm and conduction disturbance are described and are not necessarily predicted by the ECG
- amoxapine typically causes features of severe poisoning in the absence of QRS widening
- cardiac toxicity is mainly due to quinidine-like actions, slowing phase 0 depolarisation of the action potential
- toxicity is worsened by acidaemia, hypotension and hyperthermia
treatment:
(i) treat seizures aggressively with benzodiazepines
(ii) give 8.4% bicarbonate in 50mmol aliquots and titrate to arterial pH and CVS effects
(iii) adrenaline, atropine or temporary pacing may be needed for bradyarrhythmias while beta blockers, or lignocaine may be useful for trachydysrrhythmias
NB: induction of alkalosis reduces binding to myocardium and reduces CVS effects (it should be given to patients with CVS manifestations even if pH is normal)
valproate
clinical features:
- most overdoses follow a benign course with nausea, mild drowsiness and confusion
- coma can occur in large ingestions with cerebral oedema
treatment:
- valproate levels are of little value except to confirm ingestion as there is poor correlation between depth of coma and levels
- supportive care is all that is usually required
isoniazid
features:
- severe toxicity is characterised by coma, respiratory depression, hypotension & convulsions & may result from doses >80mg/kg. Protracted convulsions can cause rhabdomyolysis and ARF
treatment:
- convulsions should be controlled with benzodiazepines and pyridoxine which is a specific antidote for isoniazid poisoning.
- pyridoxine should be given prophylactically for large ingestions as early as possible since it may prevent development of complications
lithium
features:
- serum lithium levels greater than 1.5mmol/L are toxic with the main feature being varied neurological manifestations; severe poisoning may result in permanent neurological damage and nephrogenic DI
treatment:
- serum concentrations of >3.5-4.0mmol/L or patients with severe toxicity generally require extracorporeal elimination techniques; nevertheless, the majority of patients respond to supportive measures
methanol & ethylene glycol
features:
- methanol and ethylene glycol are essentially non-toxic. The metabolism of these products to their aldehydes and associated acids following a latent period of 12-18 hours accounts for the metabolic acidosis, ocular toxicity & mortality that are occasionally seen.
- mild features include dizziness, drowsiness & abdominal pain
- when treatment is delayed, metabolic acidosis develops with drowsiness, convulsions & coma
- the osmolar gap and anion gaps are increased
treatment:
- ethanol prevents the formation of toxic metabolites and is the most established treatment
- 4-methylpyrazole has also been used
NSAIDS
clinical features:
- most overdoses with NSAIDs do not cause serious problems other than gastritis; however, mefenamic acid and large doses of ibuprofen have been reported to cause self-limiting convusions and renal failure
treatment:
- supportive therapy and H2 blocker or PPI may reduce gastritis
opioids
features:
- coma and respiratory depression are the most common presenting signs
- look for needle marks, miosis, hypotension, bradycardia, hypothermia, pulmonary oedema, hyporeflexia and decreased bowel sounds
- seizures may occur after overdoses of some narcotics (eg pethidine & propoxyphene)
- there may be a concurrent infection, rhabdomyolysis, tricuspid valve abnormalities, endocarditis & problems associated with narcotic withdrawal
treatment:
- naloxone is a specific antagonist; however, it has a short half life and coma can recur
- IM dose has a longer half life. Naloxone infusion (1-4mg/hr) may occasionally be required
paraquat
features:
- this potent herbicide causes ulceration of the mucous membranes, nausea, sweating,vomiting, tremors, convulsions and pulmonary oedema. Lung fibrosis can occur up to a week after ingestion
- cardiovascular collapse and renal failure can occur
treatment:
- Fuller's earth helps adsorb paraquat in the gut. A suspension of 30%, 200-250ml every 4 hours should be used until the stools contain Fuller's earth. Activated charcoal can also be given
- avoid high oxygen concentration unless absolutely necessary as it can potentiate pulmonary fibrosis.
- immediate plasma exchange or haemofiltration may be effective but this remain unproven
- pulse therapy with cyclophosphamide or methylprednisilone may be effective in preventing respiratory complications
phenytoin
features:
- absorption is slow and unpredictable and maximal levels may not be achieved until 72hrs after ingestion
- after initial nausea and vomiting, neurological symptoms develop including drowsiness, dysarthria & ataxia & may ultimately progress to seizures
- cardiovascular toxicity is rare unless overdose has been given iv
management is supportive