Four Medical Emergencies in Psychiatry

Neuroleptic Malignant Syndrome (NMS)

This is a rare, potentially fatal, idiosyncratic reaction to antipsychotic medication, though can also be caused by other medications. NMS most commonly occurs with the use of haloperidol and fluphenazine. However, other drugs that have been reported to cause NMS include:

- **Antipsychotics** – chlorpromazine, flupenthixol, fluphenazine, haloperidol, loxapine, olanzapine, risperidone, clozapine (rarely), quietapine (rarely).
- **Antiparkinsonian drugs** – anticholinergics (withdrawal), levodopa (+ withdrawal), amantadine (+ withdrawal).
- **Antidepressants** – venlafaxine, clomipramine, trimipramine.
- **Others** – carbamazepine (+ withdrawal), lithium, ferrous sulphate, metoclopramide, oral contraceptives.

NMS is characterised by: fever, muscular rigidity, clouding of consciousness and autonomic dysfunction.

**Any patient with suspected NMS must be transferred to an acute medical setting where intensive monitoring and treatment are available.**

NMS may occur because of excessive blockade of dopamine (D2) receptors or reduced availability of dopamine. It is thought that the impaired mobilisation of calcium in muscle cells leads to muscle rigidity, sympathetic nervous system activation, or dysfunction.

NMS usually occurs in the first two weeks of commencing treatment and is twice as common in women as it is in men. The incidence of NMS lies between 0.07-0.2%, with a 5-20% mortality. Death usually occurs as a result of respiratory failure, cardiovascular collapse, myoglobinuric renal failure, arrhythmias or DIC (disseminated intravascular coagulation).

**Clinical features of NMS include:**

- Motor – generalised muscular hypertonicity, which may cause dysphagia and dyspnoea.
- Mental – akinetic mutism, stupor, and reduced level of consciousness.
- Autonomic – unstable BP (hyper- and hypotension), tachycardia, excessive sweating and salivation, and urinary incontinence.
- HYPERthermia (temp. > 38°C).

Secondary features may include: aspiration pneumonia, rhabdomyolysis, thromboembolic events, renal failure, seizures, arrhythmias, respiratory failure, DIC (disseminated intravascular coagulation).

**Risk factors for developing NMS:**

- Increased room temperature
- Patient dehydration
- Patient agitation or catatonia
- Rapid antipsychotic initiation / dose escalation
- Withdrawal of antiparkinsonian medication
- History of organic brain disease (such as alcoholism, dementia)
- Previous episode of NMS
- Co-existing affective (mood) disorder
- Patient being on drugs known to predispose NMS (e.g. lithium, anticholinergics)

**Investigations** in any patient suspected of having NMS:

- FBC (will show a raised white cell count)
- LFTs
- U and Es
- Calcium and phosphate levels
- Serum CK (may be raised)
- Coagulation screen
- ABGs (may be a metabolic acidosis)
- Blood cultures
- Urine screen (positive for presence of myoglobin)
- Serum / urine toxicology
- CXR (if aspiration pneumonia is suspected)
- ECG
- Head CT scan (if an intracranial cause is suspected)
- LP (to exclude meningitis)

**Management:**

- **Should be managed on a medical NOT psychiatric ward (may require ITU).**
- Benzodiazepines to control any acute behavioural disturbance.
- STOP ALL ANTIPSYCHOTIC MEDS!!
- Supportive measures: oxygen administration, correct hypotension / hypovolaemia with IV fluids (preferably a colloid such as Gelofusine), reduce the temperature (using cooling blankets, antipyretics, cooled IV fluids, ice packs).
- If the patient has rhabdomyolysis, they require vigorous rehydration and alkalisation of the urine using IV sodium bicarbonate to prevent them going into renal failure.
- Reduce muscle rigidity: 1st line - dantrolene (0.8-2.5 mg/kg IV qds; or 50-100mg PO od), or lorazepam (up to 5mg). 2nd line - bromocriptine (2.5-10mg PO tds, increase to max. 60mg/day), or amantadine (100-200mg PO bd).

NMS may last for 7-10 days after the cessation of oral antipsychotics and up to 21 days after that of depot antipsychotics.

With regards to follow-up, patients should be monitored closely for any residual symptoms. Once all symptoms have settled, you should wait at least 2 weeks before re-commencing antipsychotic medication. Patients should be warned of the risk of re-occurrence of NMS once they start back on antipsychotic medication.
**Delirium Tremens (DTs)**

Delirium tremens is an acute confusional state that occurs secondary to alcohol withdrawal. **DTs represent a medical emergency that requires inpatient medical care.** They occur in approx. 5% of episodes of alcohol withdrawal. Their onset is usually 1-7 days after drinking cessation, with a peak incidence at 48 hours. The risk of individuals developing DTs is exacerbated by severe alcohol dependence, co-morbid conditions (e.g., pancreatitis) and pre-existing liver damage.

**Clinical features of DTs include:**

- features of uncomplicated alcohol withdrawal (i.e., coarse tremor, sweating, insomnia, tachycardia, nausea and vomiting, generalized anxiety)
- clouding of consciousness
- marked cognitive impairment (disorientation)
- amnesia for recent events
- marked psychomotor agitation
- visual, auditory, and tactile hallucinations (typically of miniature people or animals — so-called “Lilliputian” hallucinations)
- paranoid delusions (often associated with intense fear)
- marked fluctuations in severity hour by hour, usually worse at night

The mortality associated with DTs is reported to be 5-10% and mainly occurs because of cardiovascular collapse, hypo/hyperthermia, and infection. The most high risk cases are those in which DTs develop unexpectedly and the initial manifestations are misinterpreted (e.g., in a patient not known to be alcohol-dependent, who develops symptoms post-operatively).

**Management of DTs:**

- Emergency hospitalisation is essential
- History / Mental State Examination / Physical Examination
- Investigations: FBC, ESR (or CRP), U and Es, Glucose, LFTs, Calcium, Magnesium, Urinalysis, CXR (if clinically indicated), ECG.
- Vigorous search for a medical complication, such as: infection (especially pneumonia), head injury, liver failure, GI haemorrhage, Wernicke’s encephalopathy.
- Pharmacotherapy: large doses of a drug with cross-tolerance to alcohol, e.g., benzodiazepines (oral chlordiazepoxide, up to 400 mg daily). Intravenous therapy is seldom required. Also treats any seizures. Antipsychotics (such as haloperidol) should only be used for severe psychotic symptoms, as their use is associated with a risk of lowering the seizure threshold. The patient should be given large doses of parenteral (IM or slow IV) thiamine, in the form of 2 Pabrinex ampoules, twice daily for a period of 5 days. Oral thiamine is not adequate!
- Monitor temperature, fluid balance, electrolyte levels and glucose because of the risk of: hyperthermia, dehydration, hypoglycaemia, hypokalaemia, and hypomagnesaemia. Treat accordingly with antipyretics, fluids, etc.
Acute Dystonic Reaction

An acute dystonic reaction consists of sustained, often painful, muscular spasms, which result in abnormal twisting postures. Approximately half of all cases occur within 48 hours of a patient being started on antipsychotic medication; 90% of cases occur within the first 5 days. Acute dystonic reaction most commonly occurs with haloperidol and depot preparations of fluphenazine.

Acute dystonic reactions more commonly occur in younger patients, and more commonly occur in males than females.

Clinical features
- buccolingual crisis
- oculogyric crisis (eyes rolling back, and neck arching)
- torticollis (usually associated with oculogyric and buccolingual crisis)
- opisthotonus (body arching)
- protrusion of the tongue
- difficulty in speaking
- forced jaw opening
- trismus
- facial grimacing
- lordosis or scoliosis
- tortipelvic crisis (typically involves the hip, pelvis, and abdominal wall muscles, causes difficulty with ambulation
- mental state is unaffected
- vital signs are usually normal
- remaining physical examination findings are normal

Management of acute dystonic reaction:

- Check the patient’s airway – in rare instances airway management may be required.
- Immediately discontinue the antipsychotic medication that has caused the acute dystonic reaction. Consider using a different (atypical) antipsychotic instead.
- Administer an anticholinergic - such as 5-10mg of procyclidine intra-muscularly. The IM injection should be accompanied by massage of the muscle and is usually effective within 5-10 minutes, but may need 30 minutes for relief.
- Re-assure the patient and explain what has happened.
- Write in the patient’s notes the observed clinical presentation and what treatment was given.
- Write up 5-10mg procyclidine on a PRN basis in the drug card (max. 30mg daily).
- Monitor the patient closely over the next 24 hours.
Serotonin Syndrome (SS)

Serotonin Syndrome is a rare, but potentially fatal, syndrome that occurs either when a patient is started on an SSRI antidepressant (fluoxetine, paroxetine, escitalopram, citalopram, sertraline) or the existing dose is increased. It is characterised by: agitation, tremor, shivering, diarrhoea, hyperreflexia, myoclonus, ataxia, and hyperthermia. Although, SSRIs are commonly linked to SS, many other drugs (e.g. lithium, tricyclic antidepressants, MAO inhibitors) may also potentially cause hyperserotonergic symptoms.

The incidence of SS associated with SSRI use is ~ 1% (though many cases in which the symptoms are minor go unreported); with a mortality of < 0.1%.

Symptoms and signs of SS

- **Psychiatric / neurological** – confusion, agitation, coma.
- **Neuromuscular** – myoclonus, rigidity, tremors (including shivering), hyperreflexia (usually lower rather than upper limbs), ataxia.
- **Autonomic** – hyperthermia (may be secondary to prolonged seizure activity, rigidity, or muscular hyperactivity), GI upset (nausea, diarrhoea), mydriasis, tachycardia, hyper/hypotension.

Sternbach's Diagnostic Criteria for SS

1. Other potential causes excluded (e.g. infection, metabolic disturbance, substance abuse, substance withdrawal).
2. No concurrent antipsychotic dose changes prior to onset of symptoms.
3. At least 3 of the following:
   - agitation / restlessness
   - sweating
   - diarrhoea
   - fever
   - hyperreflexia
   - ataxia
   - changes in mental state (such as confusion, hypomania)
   - myoclonus
   - shivering
   - tremor

Investigations

- FBC
- U and Es
- LFTs
- Glucose
- Calcium, magnesium, phosphate
- CK
- ABG (pH, anion gap)
- Drug toxicology screen (especially cocaine, LSD, PCP - phencyclidine)
- CXR (if there is evidence of respiratory distress / possible aspiration)
- ECG monitoring (?arrhythmia / conduction problems – prolonged QRS or QTc interval)

Treatment of SS:

- If severe, requires immediate transfer to HDU / ITU for supportive treatment and active management.
- In overdose patients, consider gastric lavage and / or use of activated charcoal.
- Establish IV access - to correct fluid volume (volume loss due to dehydration: insensible fluid loss due to hyperthermia) and reduce the risk of rhabdomyolysis.
- Rhabdomyolysis should be dealt with promptly, prioritising maintaining a high urine output combined with alkinisation using sodium bicarbonate (aim for a urine pH of 6). Reduce the patient’s body temperature if required (using antipyretics, cooling blankets, cooled IV fluids, ice packs).
- Pharmacotherapy – agitation, seizures, and muscular rigidity / myoclonus are best treated with a benzodiazepine (e.g. IV lorazepam – 1-2mg every 30 minutes; or clonazepam). In certain cases, serotonin receptor antagonists may be considered - e.g. cyproheptadine PO 4-8mg every 2-4 hours; chlorpromazine (risk of reduced seizure threshold!); mirtazepine, propanolol (mild 5-HT antagonist). Antihypertensives are not usually required unless the hypertension is persistent and clinically significant.

The onset of Serotonin Syndrome is usually acute. However, recurrent mild symptoms may occur for weeks before the onset of severe symptoms. The majority of cases of SS resolve without sequelae within 24-36 hours with adequate supportive measures. Any patient who has taken an overdose of SSRI medication who remains asymptomatic for several hours is unlikely to require further medical management.

Further reading

Please Note
These notes were written by Declan Hyland as a medical student in 2008. They are presented in good faith and every effort has been taken to ensure their accuracy. Nevertheless, medical practice changes over time and it is always important to check the information with your clinical teachers and with other reliable sources. Disclaimer: no responsibility can be taken by either the author or publisher for any loss, damage or injury occasioned to any person acting or refraining from action as a result of this information.