Sedation of the Aggressive Patient in the Emergency Department

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EMPoweRX March 2022

Disclosure

In relation to this presentation, I declare no real or perceived conflicts of interest.

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Learning Objectives

- Describe the main causes of acute agitation in the Emergency Department
- Discuss the various treatment options for the acutely agitated patient in Emergency Department
- Describe the onset of action and adverse effects of the chemical sedatives used for acute agitation

Acknowledgements

- Thanks to Simone Taylor (nil conflicts of interest) for contributing to this presentation.


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Behavioural Emergency

- https://www.youtube.com/watch?v=jxOlwO_WHrg

Definition of Behavioural Emergencies

A situation where a patient shows behaviour that potentially places themselves or others at risk of physical harm and that requires immediate targeted intervention.

Behaviours may include:

- threatening or assaultive behaviour
- refusal to cooperate
- intense staring
- motor restlessness
- purposeless movements
- labile affect
- loud speech
- irritability
- intimidating behaviour
- aggression to property
- imminent intentional or unintentional self-harm
- demeaning or hostile verbal behaviour

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Case Study -John

- 25 year old male, John, brought in by police yelling and screaming after being found agitated and running around in the local park. Police have spent the last 30mins trying to catch him.

Initial assessment / cause of behavioural emergencies

Agitation and agitated/excited delirium are not diagnoses. They are a major signs/symptoms of a variety of life-threatening diagnoses.

- Delirium may be secondary to medical disorders such as hypoxia, hypoglycaemia, hypovolaemia, hyperthermia, metabolic disturbances, infection, encephalitis
- Substance intoxication/withdrawal, particularly alcohol intoxication
- Psychiatric disorders (schizophrenia, mania, psychotic depression, personality disorders and posttraumatic stress disorder)

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Steps to management

- Verbal de-escalation and early negotiation (including the offer of oral medication)
- ‘show of force’
- Chemical restraint
- Physical restraint by a trained team

In many cases, patients do not have the capacity during these emergencies to participate in the therapeutic decision to sedate them

Yap, C.Y.L. et al., 2017. Don't Label Me: A Qualitative Study of Patients’ Perceptions and Experiences of Sedation During Behavioral Emergencies in the Emergency Department. *Academic Emergency Medicine*, 24(8), pp.957–967

Incidence of Chemical Restraint

- Sedation for acute agitation is required in 0.3% to 2% of Emergency Department presentations in Australia.

Taylor DM, Yap CYL, Knott JC, Taylor SE, Phillips GA, Karro J, et al. Midazolam-Droperidol, Droperidol, or Olanzapine for Acute Agitation: A Randomized Clinical Trial. Annals of Emergency Medicine. 2017;69(3):318-26.e1

Sedation Aims

- To achieve appropriate and safe level of sedation quickly with sufficient medication to manage the agitation.
- To facilitate an accurate assessment and appropriate management of the patient's underlying condition.
- The level of sedation should ensure that the patient is drowsy but rousable.
- The procedure is not intended to render the patient unconscious.

Patient perspective

A qualitative study of 13 patients who had presented to ED with a behavioural emergency requiring parenteral sedation found:

- The majority of patients felt that chemical sedation was appropriate treatment
- However, were frustrated post sedation due to feeling isolated, disorientated and not knowing what had happened
- Concerns around limited follow up for drug and alcohol issues
- Recommended post sedation patient debrief
  - Reorientation to time and place, contact family/friends, discuss cause of current presentation, rationale for management and address patient concerns

Therapeutic Guidelines Limited. Melbourne; March 2019
Yap, C.Y.L. et al., 2017. Don't Label Me: A Qualitative Study of Patients' Perceptions and Experiences of Sedation During Behavioral Emergencies in the Emergency Department. *Academic Emergency Medicine*, 24(8), pp.957–967

Chemical sedation required. What do you choose?

IV route	IM route
More predictable PK/PD	Less predictable PK/PD
Faster onset	Slower onset
Requires cannulation	No cannulation required

Chemical sedation required. What do you choose?

Rapid IV push medications	midazolam 5mg + droperidol 5mg	droperidol 10mg	olanzapine 10mg (IM vial used off-label as IV)
Patient numbers	118	111	120
Proportion sedated with 10mins of dose	74.6%	49.6%	49.2%
Time to adequate sedation (mildly aroused to asleep)	5 mins (IQR 3-11)	11 mins (IQR 6-23)	11 mins (IQR 5-25)

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DORM I

Intramuscular medications	droperidol 10mg	midazolam 10mg	droperidol 5mg + midazolam 5mg
Patient numbers	33	29	29
Time to sedation	20 mins	24 mins	25 mins
Additional sedation required	11 (33%)	18 (62%)	12 (41%)
Adverse Events	2	8	2
Abnormal QT interval (no TdP)	2	2	4

Isbister GK, Calver LA, Page CB, Stokes B, Bryant JL, Downes MA. Randomized Controlled Trial of Intramuscular Droperidol Versus Midazolam for Violence and Acute Behavioral Disturbance: The DORM Study. Annals of Emergency Medicine. 2010;56(4):392-401.e1.

Assessment Question

- DORM I compared IM droperidol 10 mg, midazolam 10 mg, and droperidol/midazolam 5mg/5mg. Which therapy choice caused the highest incidence of respiratory complications?
- IM droperidol 10 mg
- IM midazolam 10mg
- IM droperidol 5mg + IM midazolam 5mg

Droperidol vs haloperidol

- Droperidol provides more rapid sedation than haloperidol
- Droperidol as effective as haloperidol

Thomas H, Jr., Schwartz E, Petrilli R. Droperidol versus haloperidol for chemical restraint of agitated and combative patients. Ann Emerg Med. 1992;21(4):407-13.
Calver L, Drinkwater V, Gupta R, Page CB, Isbister GK. Droperidol v. haloperidol for sedation of aggressive behaviour in acute mental health: randomised controlled trial. Br J Psychiatry. 2015;206(3):223-8.

What is droperidol?

- An antipsychotic
- Dopamine antagonist (D2-R antagonist) from the butyrophenone family.
- The exact mechanism of action is unknown
- Causes a CNS depression at subcortical levels of the brain, midbrain, and brainstem reticular formation. It may antagonize the actions of glutamic acid within the extrapyramidal system.

PubChem [Internet]. Bethesda (MD): National Library of Medicine (US), National Center for Biotechnology Information; 2004-. PubChem Compound Summary for CID 3168, Droperidol; [cited 2022 Feb. 22]. Available from: https://pubchem.ncbi.nlm.nih.gov/compound/Droperidol

What is droperidol?

- Absorption - Droperidol was very rapidly absorbed following intramuscular administration.
- The duration of the sedative and tranquillizing effects of droperidol generally is two to four hours. Alteration of consciousness may persist as long as 12 hours.

PubChem [Internet]. Bethesda (MD): National Library of Medicine (US), National Center for Biotechnology Information; 2004-. PubChem Compound Summary for CID 3168, Droperidol; [cited 2022 Feb. 22]. Available from: https://pubchem.ncbi.nlm.nih.gov/compound/Droperidol

Droperidol concerns - DORM II

- Black box warning for QT prolongation and TdP
- Prospective multicenter observational study of patients administered droperidol for sedation of acute behavioral disturbance in the ED,
- ECG within 2 hours post drug
- 1403 patients from 6 Australian EDs (933 single droperidol 10mg dose)
- Abnormal QT 1.3%, same as control group to evaluate QT nomogram
  - Half had another cause drug (e.g. methadone) or preexisting

Adverse effects	Number	%
Desaturation (<90%)	22	1.6%
Airway Obstruction	8	0.6%
Hypotension	28	2.0%
EPSE	7	0.5%
Cardiac flutter (cardiac hx)	1	0.1%
Hypoventilation RR<12	4	0.2%
Seizure	1	0.1%
No adverse event	1333	95%

Calver L, Page CB, Downes MA, Chan B, Kinnear F, Wheatley L, et al. The Safety and Effectiveness of Droperidol for Sedation of Acute Behavioral Disturbance in the Emergency Department. Annals of Emergency Medicine. 2015;66(3):230-8.e1.

Adverse effects – SIESTA study

- Multicentre prospective observational study of 904 patients requiring parenteral sedation for acute agitation in ED
  - May have received droperidol, midazolam, olanzapine, haloperidol, midaz-droperidol, midaz-olanzapine
- 144 (15.9%) of patients had at least one adverse event.
- Most common were oxygen desaturation (7.4%), airway obstruction (3.6%), bradycardia (1.9%), hypotension (1.7%), prolonged QTc (1.3%)
- No deaths or serious adverse events with sequelae
- Factors associated with adverse event were age ≥ 65 years (OR 2.8), more than one type of parenteral sedation given within 60 mins (OR 2.1) and alcohol intoxication (OR 1.8)

Yap CYL, Taylor DM, Kong DCM, Knott JC, Taylor SE. Risk Factors for Sedation-related Events During Acute Agitation Management in the Emergency Department. Acad Emerg Med. 2019.

Assessment Question

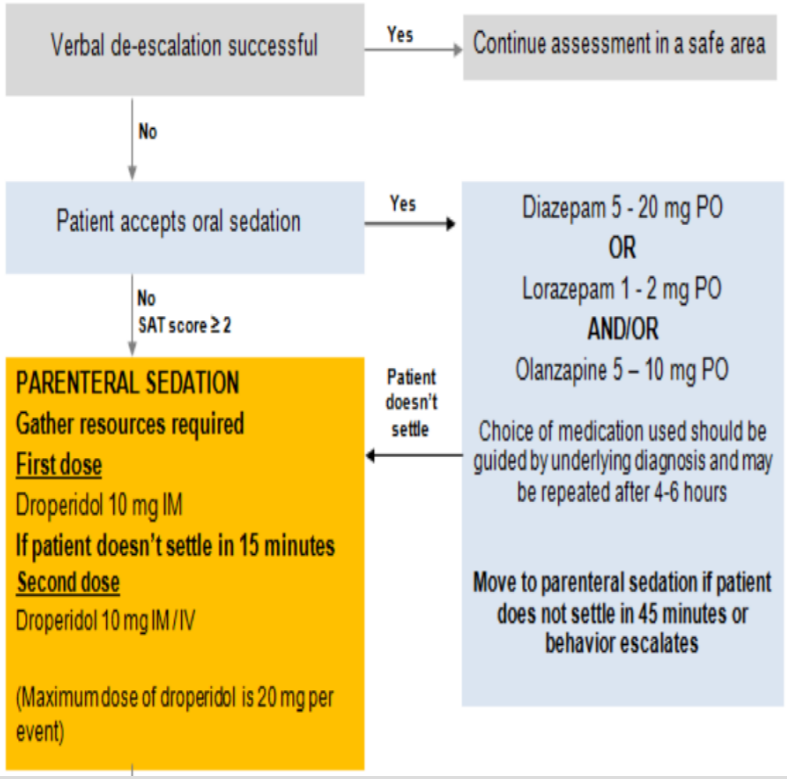
- Does droperidol significantly prolong the QT interval at therapeutic doses?
- Yes/No

Management of Patients with Acute Severe Behavioural Disturbance in Emergency Departments

NSW GOVERNMENT Health

GUIDELINE

5.1.1 Adult (under 65 years or no diagnosis of organic cognitive impairment) sedation algorithm for patients with acute severe behavioural disturbance in the emergency department



If patient doesn't settle within 15 mins of second dose droperidol

Third line agent Adults <65 years

Senior Medical consultation is required prior to use of any 3rd line agents

Midazolam 5 – 10 mg IM / IV (max dose 20 mg) OR
Diazepam 5 – 10 mg IV (max 60 mg per event) OR
Ketamine 4 – 5mg / kg IM or 1 mg / kg IV

- If intravenous access is already insitu, IV route of administration may be more appropriate
- Use five point physical restraint for sedation purposes: one on each limb & head with team leader close to patient's head monitoring airway and patient's physical condition
- **Avoid** restraining patient in a prone position as it places the patient at high risk for respiratory restriction
- Aim for Sedation Assessment Tool (SAT - see section 6.2 in Guideline) score 0 or -1 or -2
- Continuous pulse oximetry & close observation is recommended in all patients until they are able to respond to verbal stimuli. Monitor vital signs and SAT score post EACH parenteral sedation dose 5 minutely for 20 min, then every 30 min for 2 hours
- Urgent clinical review by senior medical officer if parenteral benzodiazepines are used & respiratory depression noted (e.g. SpO2 < 95%, RR < 12 or patient appears poorly perfused)
- Benztropine 1-2 mg IM / IV may be given for acute dystonic reaction.

Why is ketamine an option?

- Prospective study of 49 patients administered ketamine as rescue therapy from 2 hospitals
- Previous sedation included droperidol (10mg; 1), droperidol (10+10 mg; 33), droperidol (10+10+5 mg; 1), droperidol (10+10+10 mg; 11), and combinations of droperidol and benzodiazepines (2) and midazolam alone (1).
- Median dose : ketamine 300mg (range 50 to 500mg)
- Median time to sedation post ketamine : 20mins
- 5 patients were not sedated at 120mins (4 of these were given 200mg or less)
- Adverse effects: 2 x vomiting, 1 x transient desaturation to 90% 40 mins post dose (no airway obstruction), responded to oxygen

Isbister GK, Calver LA, Downes MA, Page CB. Ketamine as Rescue Treatment for Difficult-to-Sedate Severe Acute Behavioral Disturbance in the Emergency Department. Annals of Emergency Medicine. 2016;67(5):581-7.e1.

Ketamine concerns

- Weak sympathomimetic properties of ketamine may increase heart rate and blood pressure
- Potential decompensation of psychiatric illness
- Limited published evidence of efficacy or safety

John

- John has received 1 dose of IM droperidol 10mg
- John is still agitated
- During this time he states he has taken lots of “meth” (methamphetamine)

- What do you do?
- What do you monitor?

Conclusion

- Violence and aggression in the emergency department (ED) is a difficult and dangerous problem that can result in harm to the patient and staff.
- Important to remember the human factor
- We have many years of experience using droperidol and have found it to be safe and effective.
- Regardless of choice of agent, patient must be kept closely monitored with staff able to escalate care / intubate if needed.
- Chemical sedation sedates the patient, **does not** cure them.