Dexmedetomidine in autonomic hyperactivity states: *management of two benzodiazepine-refractory cases in Neurology Unit*

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Dexmedetomidine | Delirium tremens | Paroxysmal Sympathetic Hyperactivity

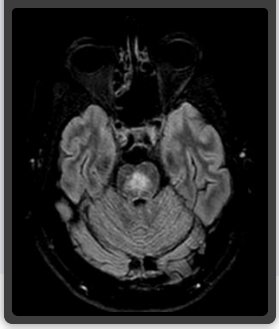
BACKGROUND

- Autonomic hyperactivity states, such as **delirium tremens** (**DT**) and **paroxysmal sympathetic hyperactivity** (**PSH**) can be refractory to benzodiazepines (BDZs) and standard sedatives[1,2].
- Dexmedetomidine (**DEX**) is a **high affinity selective α2–agonist**, providing powerful sympatholytic action, mild sedation and minimal respiratory depression[1,2]

CASE 1 — DELIRIUM TREMENS (33 y M)

- DT after alcohol–withdrawal seizure → severe agitation, hallucinations, tremors, **HR ≈150–170 bpm** and moderate hypertension (≈160/90 mmHg)
- **Refractory to very high-dose BDZs** (over 100mg of IV diazepam in 2h), and phenobarbital and tiapride.
- DEX 0.7 µg/kg/h→ **rapid control, arousable sedation without intubation**
- Relapse during a one-day taper → re-start and wean over 3 days;
- **MRI**: pontine T2/FLAIR hyperintensity consistent with prior osmotic demyelination (**FIGURE 1**).

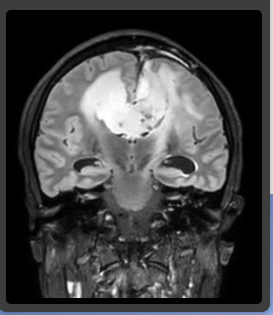
FIGURE 1 — T2/FLAIR central pontine osmotic demyelination



CASE 2 — PSH DUE TO BRAIN TUMOR (22 y M)

- WHO grade–4 callosal, bifrontal astrocytoma with hydrocephalus (**FIGURE 2**)
- **Recurrent PSH paroxysms** (diffuse asymmetric tremors, tachycardia, hypertension, hyperthermia, dystonic posturing); EEG excluded underlying epileptic activity.
- Recurrence despite a combination of anti–seizure medications (ASMs), steroids, maximal anti–edema therapy, β–blockers, and high–dose of BDZs.
- **DEX 0.7 → 1.4 µg/kg/h achieved control**.
- Attempts <0.5 µg/kg/h → recurrence aborted by 10–minute boluses of 0.5–1 µg/kg.
- No respiratory or hemodynamic instability observed.

FIGURE 2 — bifrontal callosal astrocytoma with hydrocephalus (FLAIR)



PRACTICAL DOSING

- Start 0.2–0.7 µg/kg/h, titrate to effect (commonly 0.4–1.4 µg/kg/h).
- Target cooperative/arousable sedation.
- Optional rescue bolus 0.5–1 µg/kg over 10 minutes for breakthrough sympathetic crises.
- Once stable, avoid abrupt down-titration—taper gradually to reduce relapse/rebound risk with α2-agonists.
- **Concurrent β-blockers use**—particularly β1-selective agents (e.g., esmolol)—**is generally safe** when used as needed, with monitoring for bradycardia and hypotension

CONCLUSIONS & KEY MESSAGES

- Sympatholytic action and **arousable sedation → no respiratory depression → facilitates neuro exam**
- **Probably superior to benzodiazepines** for autonomic storms, yet non-etiologic—appropriate as adjunctive therapy, **not as standalone**.
- Fast titration for paroxysmal storms; **useful outside ICU when intubation is not indicated/desired.**
- Although labeled for ICU sedation, DEX's manageability and minimal respiratory depression make it **feasible in high-dependency/step–down units.**

REFERENCES

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