



Background

Geriatric patients are often less than ideal candidates for general anesthesia. Regional anesthetic techniques could prove advantageous by reducing stress on the patient and limiting medications that contribute to postoperative cognitive dysfunction (POCD).

The challenge with a regional anesthetic is safely sedating the patients enough to tolerate the nerve block placement. Complicating this are recommendations against the use of some common sedative medications for geriatric patients or patients with dementia, due to risks for POCD.

Clinical Question

For geriatric patients with diagnosed dementia, can dexmedetomidine be safely used for procedural sedation during regional nerve block administration?

Case Report

- A 90-year-old woman with dementia required an open reduction and external fixation of the tibia, fibula, and talus. General anesthesia was avoided due to her comorbidities, and a spinal anesthetic was contraindicated due to dual antiplatelet therapy. Monitored anesthetic care with a regional nerve block was the safest anesthetic choice.
- Due to the patient's age and dementia, midazolam was avoided for procedural sedation. The patient only received fentanyl 100 mcg intravenously during nerve block placement, providing minimal sedation. Due to medication constraints for this patient, she could not remain still for the procedure.
- The patient's continual movement resulted in inadvertent intravenous access with the block needle, which was promptly identified by aspiration and rectified before the injection of local anesthetic.
- After successful nerve block placement, the patient tolerated the surgical procedure well with an intraoperative propofol infusion and no additional narcotic requirements during recovery.

Evidence Based Discussion

- Gamma-aminobutyric acid (GABA) agonists increase the risk of POCD in geriatric patients.
- An alpha2-adrenergic agonist, dexmedetomidine does not interact with the GABA receptor.
- Dexmedetomidine provides analgesia and is synergistic with opioids.
- Dexmedetomidine preserves respiratory function, airway reflexes, and cerebral blood flow better than midazolam.
- Dexmedetomidine can reduce delirium in critically ill patients and be neuroprotective after acute ischemic and traumatic neurological injuries.
- Dexmedetomidine can attenuate the toxicity of beta-amyloid, a significant contributor to the pathogenicity of Alzheimer's disease.

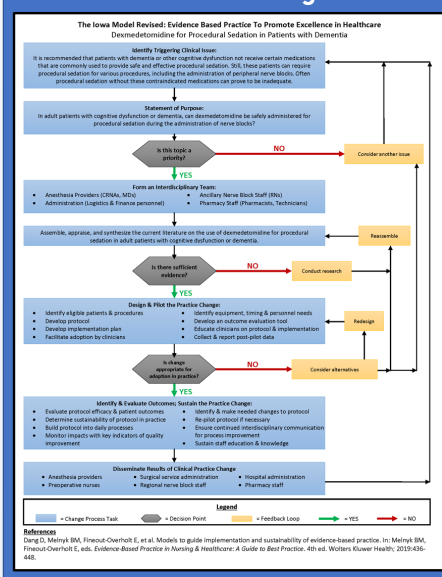
Translation to Practice

- Dexmedetomidine would be appropriate for this patient without increasing the risk for POCD.
- Dexmedetomidine does not interact with the GABA receptor, is opioid sparing and has less risk of POCD.
- Possible neuroprotective effect, especially in those with acute ischemic or traumatic neurological injuries or degenerative neurological diseases such as Alzheimer's.
- Dexmedetomidine's synergism with opioids could facilitate reduced opioid administration and associated adverse effects.
- Efficiency of preoperative sedation is challenged by the 10-minute loading-dose period.
- Rapid administration of dexmedetomidine can cause transient hypertension, bradycardia, hypotension and sinus arrest.

Implementation

- Procedural sedation protocol to guide providers and staff on appropriate dexmedetomidine uses and how to minimize inefficiencies.
- Dexmedetomidine procedural sedation standardization requirements:
 - Preparations available in preoperative area medication cabinets
 - Use of infusion pumps versus intravenous bolus administration
 - Order sets to allow preoperative nurses to retrieve medications ahead of time.
- Requires coordinated efforts by a multidisciplinary team of anesthesia providers including preoperative nurses, block nurses, pharmacy staff, and administration.
- Criteria to compare the efficiency between dexmedetomidine and current practice.
- Criteria to evaluate patient outcomes to support long-term implementation.
- Further research areas:
 - Sedation adequacy and safety in the geriatric population versus common GABA agonists
 - Procedural sedation recovery periods and adverse effects versus common GABA agonists

EBP Framework Algorithm



Adult Dosing Recommendations

Initiation of Procedural Sedation

- 1 mcg/kg loading dose over 10 minutes
- 0.5 mcg/kg loading dose over 10 minutes for less stimulating procedures and patients over 65 years of age

Maintenance of Procedural Sedation

- 0.2 - 1 mcg/kg/hour titrated to effect
- Initiate infusion at 0.6 mcg/kg/hour
- Patients over 65 years of age should receive a dose reduction

Questions?

mwalke12@samford.edu

References

Scan this QR code for a complete reference list.

