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LETTER TO THE EDITOR

Combined use of fascia iliaca block, subarachnoid block and dexmedetomidine sedation for patients having fractured femur surgery

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To the Editor:

Anesthesia for the patient with a fractured hip is frequently encountered and is often very challenging due to advanced age, cardiac and respiratory co-morbidities and dementia/delirium. No guidelines exist as to the best method of anesthesia for hip fracture surgery, however there is general agreement that avoiding polypharmacy, utilizing regional and neuraxial anesthesia and avoiding excessively deep anesthesia is likely optimal. For patients requiring fixation of femoral neck fractures, we present the novel anaesthetic management of dexmedetomidine (DEX) sedation, fascia iliaca regional block (FIB) and subarachnoid block (SAB).

Patient characteristics, surgical procedure and anesthetic conduct are presented in Table 1. In the operating theatre a DEX loading dose averaging 0.85 mcg/kg (range 1.3–0.3 mcg/kg) was administered over 10 min. As DEX has few amnestic properties, a small dose of midazolam was also administered. Concurrently, a FIB was carried out by the classic 2-pop technique using a 16 gauge Touhy needle and 0.5 % ropivicaine. DEX was converted to a maintenance infusion averaging 0.85 mcg/kg/h (range 1–0.7 mcg/kg/h) and adjusted to optimize sedation and minimize side effects. The FIB was given 15 min to take effect, and SAB was carried out in the lateral position with the fractured side up. The administration of cardiovascular drugs was not required in three of four patients, and no airway obstruction occurred. The DEX infusion was decreased based on trends of heart rate and blood pressure, and discontinued once closure of fascia had begun.

SAB may be preferred over general anesthesia as it is associated with reductions in early mortality, postoperative confusion, myocardial infarctions, pneumonia, deep vein thrombosis, fatal pulmonary embolism and postoperative hypoxia [1]. In non-cardiac surgery DEX is associated with a trend to improved cardiac outcomes and improved all-cause mortality, while decreasing non-fatal myocardial infarctions, and myocardial ischemia—α_2-receptor agonists attenuate the stress response and may prevent cardiac complications [2]. Hip fracture patients often suffer from delirium and dementia—up to 50 % of patients with hip fractures have delirium accompanying their acute orthopaedic injury [3]. Interventions to decrease delirium include minimizing the use of narcotics and benzodiazepines, effective pain management, use of regional and neuraxial anesthesia, and maintaining a lighter plane of anesthesia [3]. DEX produces sedation and analgesia by acting both peripherally and centrally, is purported to have a role in neuroprotection and improves effectiveness of SAB [4].

FIB is effective in this patient population as it decreases the amount of medication needed for SAB, is performed quickly and easily in the supine position and does not rely on optimal coagulation status. In these patients FIB can be utilized as the main anaesthetic for positioning the patient for SAB, is more efficacious than IV opioids in facilitating the lateral position for SAB and aids postoperative pain control [5]. We utilize 0.5 % ropivacaine in a large volume without complication to allow a relatively quick onset for positioning while maintaining a longer post-operative duration.

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Table 1 Patient characteristics and conduct of anesthesia

Case #	1	2	3	4
Age (years)/gender	76/Male	85/Female	88/Female	86/Male
Medical comorbidities	Parkinson's disease Paget's disease Prostate cancer Diabetes II Recent aspiration pneumonia	Chronic hyponatremia GORD Diverticulitis Hypertension Alzheimer's dementia	Dilated cardiomyopathy (EF 29 %) 2 + Aortic regurgitation 2 + Mitral Regurgitation Moderate Mitral stenosis Dementia	Parkinson's disease Dementia
Surgical procedure	Pin and plate	Hemiarthroplasty	Intra-medullary nail	Cannulated hip screw
Midazolam dose (mg)	2	1	1	1
DEX loading dose over 10 min (mcg)	50 (0.8 mcg/kg)	20 (0.3 mcg/kg)	50 (1.3 mcg/kg)	50 (0.9 mcg/kg)
DEX infusion (mcg/kg/h)	1 mcg/kg/h	0.7 → 0.5 mcg/kg/h (decrease due to mild bradycardia)	0.8 → 0.3 mcg/kg/h (decrease due to mild hypotension)	0.9 mcg/kg/h
mL of 0.5 % ropivacaine used in FIB	40	40	30	30
Isobaric 0.5 % bupivacaine in SAB (mL)	2.5	2.6	2.5	2.5
Fentanyl in SAB (mcg)	15	15	15	10
Vasoactive medication	Nil	Nil	2 mg metaraminol	Nil

DEX may be extremely useful for the neurologic and cardiovascular effects described above, however it can cause hypotension and bradycardia, so the patient requires close monitoring.

The Research and Ethics Committee of The Prince Charles Hospital approved this submission.

Conflict of interest One author (I. L. Rapchuk) has received honoraria from the pharmaceutical company Hospira.

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