Sedation, spinal anesthesia and older patients

The main uses of sedation in regional anesthesia are to reduce anxiety and improve patient comfort and cooperation.\(^1\) Although spinal anesthesia provides anesthesia of the surgical site, unpleasant and uncomfortable patient experiences result from having to remain in the same position, prolonged duration of surgery or ambient noise in the operating room. Patients may desire amnesia or reduced awareness of the surgical event.

These benefits come at a price though and all anesthesiologists are familiar with complications such as delayed recovery, airway obstruction, hypoxia, hypotension and midazolam-associated paradoxical excitation.

Propofol and midazolam are the commonest agents used for sedation. In older patients undergoing spinal anesthesia, concerns regarding adverse cardiovascular effects or prolonged sedation from altered pharmacokinetics are of particular interest. Martin et al., in a retrospective study of 30,842 anesthetic cases, demonstrated that for every decade after 40 years there is approximately an 8% decrease in the dose of propofol or midazolam used by anesthesiologists.\(^3\) These dosage requirements are based on perceptions of probable pharmacokinetics in older patients as there is a lack of prospective information regarding propofol and midazolam use for sedation in older patients receiving spinal anesthesia.

This deficit has been somewhat addressed by the study reported in this edition of the Journal comparing propofol (bolus 0.4 mg/kg; infusion 3 mg/kg/hr) with midazolam (bolus 0.02 mg.kg\(^{-1}\); infusion 0.06 mg/kg/hr) in patients older than 60 years of age, undergoing urological surgery with spinal anesthesia.\(^3\) The authors demonstrated that propofol results in faster onset (13.0 ± 4.2 vs. 18.8 ± 4.2 min) and offset times (8.9 ± 2.8 vs. 12.5 ± 3.5 min) with greater duration of adequate sedation (44.7 ± 12.5 vs. 29.8 ± 12.9%) than midazolam. However, patients receiving propofol were three times more likely to have a hypotensive episode (50% vs. 14.3%, \(P=0.003\)).

There have been few studies that have compared the sedative effects of titrated infusions of propofol and midazolam. White and Negus compared variable-rate maintenance infusions of midazolam (8.6 ± 5.4 mg/hr) with propofol (265 ± 185 mg/hr) following a loading dose, in patients undergoing elective surgery under a variety of regional anesthesia techniques.\(^4\) Although propofol was less sedating, with fewer episodes of drowsiness, confusion or clumsiness, discharge times were similar in the two groups. Wilson et al. demonstrated that a mean infusion rate of 3.65 mg/kg/hr propofol compared with 0.26 mg/kg/hr for midazolam in 40 patients with spinal anesthesia, resulted in more rapid recovery, as judged by the ability to eye open and recall their date of birth. Amnesia, as in White and Negus’ study, was significantly greater after midazolam. There were no differences in hemodynamic parameters, however, the average patient age was 55 years compared with 70 years in the present study.

Therefore, although propofol results in faster, smoother and more predictable sedation with reduced short-term cognitive impairment, older patients are at greater risk of hypotension. Aiming for a lower level of sedation (score of 4 on the modified Observer’s assessment of alertness/sedation scale) may reduce this incidence. Unfortunately, in this study, only the patient and not the investigator were blinded to the treatment protocols and hence sedation targets; this may have introduced bias. It is also important to note that with both techniques there was a 25% incidence of airway obstruction requiring intervention.

Finally, the authors only studied recovery from sedation and did not investigate the effects of either drug on psychomotor or postoperative cognitive function.\(^3\) This would have been of great interest as we know that elderly patients recover from the sedative effects of propofol in a similar manner to younger patients but demonstrate delayed recovery of psychomotor function – a factor that may prolong postoperative stay.

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References