

Alleviation of Postoperative Delirium by Spinal Anesthesia in Elderly Patients with Hip Fracture

Sir,

Postoperative delirium, an acute disturbance of consciousness, is a transient organic brain syndrome with disturbance and disorder in attention, sensation, thinking, memory, psychomotor, and sleep cycles.¹ It is one of the common postoperative complications in elderly patients with hip fractures. Smith *et al.* found 44% incidence rate of postoperative delirium in elderly patients with hip fractures.² Postoperative delirium usually occurs within five days after surgery, especially 24 to 48 hours after surgery. It affects postoperative recovery, and prolong length of stay in hospital, as well as increases medical costs and patient mortality.³ At present, the effect of different anesthetic methods on postoperative delirium in elderly patients with hip fractures draw limited attention by clinicians. Generally speaking, general anesthesia and spinal anesthesia are the common practice in elderly hip fracture surgery. The effect of general anesthesia and spinal anesthesia on postoperative delirium in elderly patients with hip fractures remains unclear. The author found that spinal anesthesia could reduce the postoperative delirium in elderly patients with hip fractures.

A total of 82 elderly patients with hip fractures were selected as subjects. Patients with preoperative psychiatric disorders, diabetes mellitus, electrolyte imbalance (hypo/hypernatraemia), decreased hearing or vision, infection; hypoxia/acidosis, pre-medications used-BZP, opioids, anticholinergics, H₂ receptor antagonists, and patients who could not tolerate the surgery were excluded.

The patients were randomly divided into group A and group B of 41 cases each. Both groups were operated by the very same team of experienced orthopedic surgeons. Group A was subjected to general anesthesia, of which anesthesia induction method was intravenously injected 0.07-0.08 mg/kg midazolam, 4 µg/kg fentanyl, 0.7 mg/kg atracurium and 0.2 mg/kg etomidate. Endotracheal intubation was performed after muscle was fully relaxed then the mechanical ventilation was conducted routinely. Isoflurane, atracurium and fentanyl were used for intraoperative continuous anesthesia. The postoperative analgesia was controlled through intravenous. Group B was subjected to spinal anesthesia, which called for the

patients laid on the side. Then the patient was punctured through L₂₋₃ points and was inserted with a hard external puncture needle. After cerebrospinal fluid outflow, 1-1.5 mL of 0.75% bupivacaine was injected into the patient. Collected data were analysed using Chi-square test by SPSS version 25. P-value of less than 0.05 was considered significant.

Patients aged from 66 to 90 (78.41 ±3.62) years. There were 32 males (39.02%) of total selection and 50 females (60.98%). The time from injury to operation was 3 to 9 (6.2 ±1.7) days. There were 47 cases (57.32%) of intertrochanteric fractures and 35 cases (42.68%) of femoral neck fractures. According to the American Society of Anesthesiologists (ASA) Grading for preoperative cases, there were 11 cases (13.41%) of grade I, 43 cases (52.44%) of grade II, and 28 cases (34.15%) of grade III.

Postoperative delirium was diagnosed by the consciousness assessment method (CAM), recommended by the Fourth Edition of the American Mental Disease Diagnosis and Statistics Manual (DSM-IV).

American ICU Disorder Assessment Method (CAM): Delirium took place in 18 cases (43.90%) in group A, and 9 cases (21.95%) in group B. The difference of postoperative delirium incidence between the two groups was statistically significance ($p = 0.034$).

The relatively high incidence of delirium after general anesthesia may be caused by direct effect of general anesthetic drugs such as fentanyl that affects the central nervous system of the human body to produce delirium. It may also induce postoperative delirium by affecting the balance of neurotransmitters in the brain, such as acetylcholine. One study showed that spinal anesthesia could reduce postoperative delirium in opium dependent patients undergoing coronary artery bypass grafting.⁴ This study found that spinal anesthesia reduced the incidence of postoperative delirium in elderly patients with hip fractures. This might be due to spinal anesthesia having less effect on hemodynamics and central nervous system than general anesthesia in elderly patients with hip fractures. However, different results have been reported earlier. Kamitani *et al.* pointed out the rate of postoperative delirium was similar between the general anesthesia ($n=21$) and spinal anesthesia ($n=19$) in geriatric patients with femoral neck fracture during the 4-day postoperative period.⁵ This might be due to the deviation in different sample sizes. It is suggested that the sample size should be expanded for further verification in the future. Furthermore, there was no clear evidence of the cause and mechanism of postoperative delirium, which compounds the difficulty in its diagnosis and treatment.

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