Continuous Spinal Anesthesia in a High Risk Elderly Patient Using Epidural Set

Sir,

In the elderly there is a high prevalence of medical problems and a reduction in physiologic compensatory mechanisms.

There are probably no healthy patients who are too old for anaesthesia. Age related disease, and not the ageing itself largely determines the morbidity and mortality that characterize an elderly surgical population. No single anaesthetic technique or agent appears to have universal advantage for the elderly surgical patient with regards to survival. Neither regional nor general anaesthesia has clearly demonstrable superiority of outcome in patients who are elderly.[1]

Spinal anesthesia is a widely used anesthetic technique for lower limb surgery in the elderly. Spinal anesthesia is often preferred for its efficacy, rapidity, minimal effect on mental status, reduction of blood loss, and protection against thrombo-embolic complications.[2] But risk of severe and prolonged hypotension is associated with spinal anesthesia. This is due to the rapid extension of the sympathetic block, hindering cardiovascular adaptation and causing significant morbidity and mortality.[3,4]

The continuous spinal anaesthesia (CSA) technique offers several advantages over single-shot spinal anaesthesia in patients undergoing extensive surgery of the lower part of the body. It has been reported to be more rapid in action, producing more pronounce sensory-motor blockade with fewer haemodynamic alterations and side effects by enabling the reduction and fractionation of the induction dose through a catheter. But, CSA has been implicated in causing specific complications, such as infection, headache, or cauda-equina syndrome.[5,6]

A 90 year male presented for open prostatectomy for benign hypertrophic prostrate. He was a chronic heavy smoker. On examination the patient was thin and lean. Bilateral air entry was reduced in both lung fields. Patient had sinus tachycardia. Routine investigations were with in normal limits. Chest X ray showed bilateral emphysematous changes. Echocardigraphy revealed Ejection fraction of 45% and there was also mild diastolic dysfunction. Prostrate size was 6.9 x 5.8 x 5.9 cm with a residual volume of 113 cc and middle lobe was grossly enlarged. In pre-anaesthetic medication he was prescribed alprazolam 0.25 mg at bed time and again at 6 am. Patient was sedated having Ramsay sedation score of four.

In view of 90 year of age with much sedative effect of pre-anaesthetic medication along with compromised cardio-respiratory status, regional anaesthesia was considered as the technique of choice.

In lateral position under full aseptic precaution 19 G tuohy epidural needle was inserted into L3-L4 space (pediatric epidural set- portex). After obtaining free flow of cerebro-spinal fluid a 20G protex epidural catheter was simply threaded into the subarachnoid space up to a distance of 2-3 cm. 0.5% of hyperbaric bupivacaine (0.8ml) injected intrathecally over 30 sec through catheter and fixed. Patient turned to supine. It took 12 minutes to achieve desired effect up to T8 along with adjustment of position. There was a significant blood loss during surgery which was managed with i.v. crystalloids, colloids and blood. Patient remained haemo-dynamically stable through-out surgery with heart rate between 64-78/min and blood pressure from preoperative of 124/66 mm of Hg to a maximum of 132/72 mm of Hg to a minimum of 96/56 mm of Hg. Patient remained comfortable during the procedure. Further two doses of 0.2 ml after 90 minutes and after 120 minutes were given through epidural catheter, when we noticed facial grimacing in the patient. Total duration of surgery was 130 minutes. Postoperatively the sensory blockade persisted for 2 hours and at this point another top up with 0.2 ml of 0.5% bupivacaine was administered and catheter was removed. Patient was followed up for 7 days. There was no evidence of infection, neurological deficit or PDPH. Patient was discharged and was asymptomatic on the last follow up visit.

There are no absolute indications for spinal and epidural anaesthesia. However, there are clinical situations in which patient's preference, his physiology or the surgical procedures to be done, makes central neurological blockade the anaesthetic technique of choice.

There is also some evidence showing that these techniques improve the outcome in selected situations. Spinal

and epidural anaesthesia has been shown to blunt the stress response to surgery, decrease blood loss intra-operatively, to lower the incidence of post operative thrombo-embolic event, decrease mortality and morbidity in high risk patients. In addition both spinal and epidural techniques can be used for postoperative analgesia. Inserting a catheter in subarachnoid space increases the utility of spinal anaesthesia by permitting repeated drug administration as often as necessary to extend the level and duration of spinal block. The technique is similar to that described for single shot spinal anaesthesia except that a large enough needle must be used to accommodate the desired catheter.

Initially micro-catheters were recommended (28 Gauge) for CSA as the quantity and direction of anaesthesia could be controlled and the incidence and severity of post dural puncture headache (PDPH) can be greatly reduced. Due to high resistance of micro-catheters and slow speed of injection, there are two main problems were reported[5] i.e. inadequate anaesthesia and neurotoxic effects- caudaequina syndrome.

Several studies have shown that fine catheters may bend during insertion. Engelbert Deush et al compared different small bore catheters (22 to 28 Gauge) for the maximal tensile strength. There is a strong correlation between the maximal tensile strength and the outer diameter and wall thickness of the catheter. They concluded that with higher tensile strength reduction in the risk of catheter breakage is there[7].

Variety of larger size catheter has been recommended for continuous spinal anaesthesia. Commonly 18 G epidural needles and 20 G catheters are being used.

Smallest Gauge epidural we had available with us was pediatric epidural set with 19 gauge needle and the length of needle was not of concern as the patient was lean and thin. We have used pediatric epidural minipack system I (portex) with 19 gauge Tuohy needle of 50 mm length and a 22 gauge catheter was threaded through it intra-thecally. To decrease haemodynamic consequences, reduction of local anaesthetic doses is recommended. We have given 0.8 ml of 0.5% bupivacaine heavy in our case.

Standard CSA set contains 18G epidural introducer needle (Spinocath-B Braun) 3.5 inches long and 22G catheter with 28G spinal needle. Priming volume of 0.1 ml. That was comparable to what we used.

CSA was given by Rao et al through a macro-catheter to 847 vascular surgery patients (puncture needle of 19G and 22G catheter) with a low incidence of minor neurological sequelaes.[8] Lindergren and colleagues with puncture needle of 19G and 22G catheters, in both vascular and non-vascular surgeries observed some increase in number of erythrocytes in cerebrospinal fluid (CSF) in post operative period, but with minor or no neurological consequences.[9]

Favrel et al also shown that continuous spinal anaesthesia (CSA) using small titrated dose of 0.5% hyperbaric bupivacaine was better than single dose spinal anaesthesia in elderly patients.[10]

Unexpectedly prolonged duration of surgery because of bleeding and inadequate haemostasis CSA used in this old fragile patient helped us for extension and maintenance of anaesthesia.

Deliberate intrathecal insertion of epidural catheter has been recommended to prevent severe PDPH and also to be used as spinal catheter for CSA in cases of accidental dural puncture especially in obstetric[11] and orthopedic surgeries.[12] This is also supported by survey conducted in UK, aimed to explore current management for accidental dural puncture during introduction of anaesthesia.[13] This also reduces the requirement for epidural blood patch.

For these reasons use of epidural catheter as spinal catheter is gaining acceptance now a days. The slow onset block of the sympathetic system with this technique allows the cardiovascular system to adapt more easily than when the block is more abrupt as in single dose spinal anaesthesia. This is first time that prostate surgery has been done under continuous spinal anaesthesia using the standard epidural set. This technique is safe in geriatric patients and is also cost-effective.

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