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Central neuraxial blocks: Complacency begets complications

The credit for introduction of central neuraxial blocks (CNBs) goes to J Leonard Corning, an American neurologist who injected cocaine between the spinous processes in the year 1885 and to August Bier, a German surgeon who performed surgery after the first spinal anaesthesia in human beings in 1898. It is thus more than a century of successful use of spinal anaesthesia. However, the complications arising from spinal anaesthesia received wide publicity after the unfortunate events involving two patients, Woolley and Roe, in 1947^[1] and put a question mark over its use at least for a few decades.

Subsequent improvements and understanding of the technique have led to spinal anaesthesia being branded as a safe, reliable, predictable and easy to perform anaesthetic procedure. Millions of patients throughout the world have richly benefitted from this safe and simple technique. However, this safe technique can still become unsafe and result in unanticipated morbidity and at times, mortality. Published in this issue of IJA are reports of complications attributed to CNBs, ranging from post-dural puncture headache (PDPH) to pneumocephalus, arachnoiditis, epidural haematoma, rectal perforation and aphonia^[2-7] clearly indicating their occurrence, despite the professed improvements in the field. This reinforces the need for adopting meticulous measures while performing these simple procedures.

We need to remember that when the spinal needle reaches the subarachnoid space, it has breached all the defence mechanisms of the central nervous system and one of the most dreaded consequences could be the neurological sequelae. The neurological sequelae could be caused either by introduction of infection from septic focus, bleeding and haematoma formation inside the vertebral column, triggering of

inflammation, continuous leakage of cerebrospinal fluid, physical trauma, chemical trauma and ischaemia due to circulatory disturbances. Hence, it is prudent that when we teach the residents and trainees to perform this procedure, we need to educate them specifically about the possible complications and equip them with the knowledge to identify and treat them at the earliest. The American Society of Regional Anaesthesia (ASRA) practice advisory on neurologic events in regional anaesthesia and pain medicine addresses the aetiology, differential diagnosis, prevention and treatment of these complications.^[8]

Strict aseptic precautions have to be adhered to while performing these procedures. This will include mandatory 2 min of hand scrubbing with chlorhexidine in alcohol by the performer,^[9] wearing a sterile apron and glove, cap and mask, using dedicated sterile trays, preparation of the patient's back by scrubbing with chlorhexidine in alcohol and allowing a contact time of 2 min before introducing the needle. This would go a long way in decreasing infectious complications.^[10]

PDPH is possibly the most common complication arising from neuraxial procedures. The current small gauge spinal needles have decreased the incidence of PDPH. However, if PDPH occurs, it should be treated effectively. Anaesthesiologists across the globe use several methods to treat PDPH. The national survey done in the United States^[11] showed several treatment options being practiced in the United States including aggressive oral and intravenous hydration, oral and intravenous caffeine, bed rest, oral and intravenous opioids, non-opioid analgesics, epidural saline, abdominal binder, 5-hydroxytryptamine agonists, adrenocorticotrophic hormone synthetic analogues and epidural blood patch (EBP).

Although EBP is one of the mainstays of treatment for intractable PDPH, there is increasing evidence that the simple, non-invasive sphenopalatine ganglion block offers a safer alternative in treating PDPH. Sphenopalatine ganglion block can be performed by applying cotton-tipped applicators saturated with 5% water-soluble lignocaine ointment into each nostril for 10 min. Shaul *et al.*^[12] in a study showed that 69% of the 32 obstetric patients with significant symptoms after PDPH benefitted from sphenopalatine ganglion block. Obviously, this method is safer, cost effective and less invasive than EBP which can be associated with unwanted sequelae including infection, needle trauma, back pain, subdural and epidural haematoma and a possible second dural puncture.

Yet another area of great interest and concern is administering neuraxial blocks in patients receiving antiplatelets and anticoagulants. There are several guidelines that are available to guide the anaesthesiologists when they are confronted with such patients. In this issue, we have a case report of spinal epidural haematoma^[5] seen following removal of epidural catheter after an elective intra-abdominal surgery in an 86-year-old hypertensive patient. The authors report this occurrence despite strict adherence to the ASRA guidelines. The authors postulate that this could be because of deranged renal function though the creatinine was within normal limits, the renal function could be impaired in spite of a normal creatinine owing to the decreased muscle mass in geriatric patients and the functional impairment of renal function probably prolonged the duration of action of the low molecular weight heparin that was being administered to the patient. Current research work highlights the importance of estimating the glomerular filtration rate rather than the creatinine levels in accurately estimating renal function.

Pneumocephalus following spinal anaesthesia is a very rare entity. However, this needs to be kept in mind while treating a patient with acute neurological and cognitive dysfunction following spinal anaesthesia. A report in this issue of IJA^[3] highlights the need to obtain radiological imaging in patients having neurological symptoms following spinal anaesthesia. It is also very important to document the neurological sequelae and obtain the neurologist's opinion at the earliest.

The addition of adjuvants to the local anaesthetic solutions for CNBs has added a new set of issues.

Transient loss of voice following labour analgesia under combined spinal epidural technique has been attributed to the addition of fentanyl intrathecally in another report^[7] due to possible cephalad migration of the drug. This article highlights the need to factor various pharmacological agents used either as adjuncts or for conscious sedation while analysing the multitude of after-effects and complications that follow administration of CNBs.

The six reports^[2-7] published in this issue highlight the various possible complications that can follow the 'simple' procedure of spinal anaesthesia. Hence, it is prudent that every anaesthesiologist adheres to strict protocols, follows the guidelines, incorporates aseptic principles, follows-up the patients in the post-operative period, detects the complications early and treats them aggressively and appropriately. We must mandatorily explain the procedure and possible complications to the patients, obtain valid consent and document the procedure in the case file.

CNB, especially spinal anaesthesia is a boon to the anaesthesiologist. Let the benefits continue to be passed on to the patients. Complications are more likely the consequences of complacency... we shall prevent them.

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