Voice change after spinal anaesthesia

Sir,

A 22-year primigravida presented for caesarean section and hip arthrotomy. The preanaesthetic check-up was unremarkable. After preloading with 500 ml of lactated Ringer's solution, initial epidural catheterisation in sitting position resulted in an unintended dural puncture (UDP). However, epidural catheterisation was successful at L2-L3 interspace in the subsequent attempt. Subarachnoid block (SAB) with 2 ml 0.5% hyperbaric bupivacaine and 10 μg fentanyl was administered at the L4-L5 interspace. The patient was immediately made supine with 15-degree lateral tilt. A few minutes later, a change in the patient's voice was noticed (low pitch, clear articulation) with a weak cough reflex. The height of sensory block was T1, blood pressure was 108/66 mm Hg, and the heart rate was 78 BPM.

The patient was given 100% oxygen and vigilant monitoring of haemodynamic and respiratory parameters was continued. She remained haemodynamically stable throughout the procedure with systolic blood pressure >100 mmHg (>80% of preoperative value) at all times without the use of vasopressors and did not have bradycardia. Both LSCS and arthrotomy were completed in 90 minutes without any need for epidural supplementation. By this time, her voice quality returned to normal and she had a good cough reflex. The epidural catheter was removed. A detailed neurological evaluation resulted normal.

After high SAB, active exhalation is impeded by abdominal and intercostal muscle paralysis with reduction in lung volumes. Patients may complain of dyspnoea due to the inability to feel chest wall movement during breathing. Simple reassurance is usually effective in allaying patient distress. However, the inability to speak clearly may be a sign of impending total spinal anaesthesia.

There are many other causes of voice change after SAB. While subdural administration of spinal drug usually leads to failed SAB, rostral spread to brain stem can cause excessive sensory blockade, sparing of sympathetic function, motor weakness of upper extremities, and delayed or faster than usual block onset. Total spinal anaesthesia due to inadvertent subarachnoid or subdural placement of local anaesthetic intended for epidural use may lead to severe hypotension. Hypotension decreases cerebral blood flow and, in a hypercoagulable state like pregnancy, may lead to a transient ischaemic attack, manifesting as voice change.[1] Absence seizures may cause transient dysphonia after SAB. Intrathecal administration of lipophilic opioids may cause dysphagia, facial numbness, and aphasia due to rapid rostral spread to the speech area or cranial nerves.[2]

Dysphonia may rarely develop due to a reduction in CSF volume and ICP after SAB with downward displacement of the brain stem and traction on lower cranial nerves or compression of vagus nerve by brain parenchyma and blood vessels leading to a vocal fold palsy (VFP).

Mucosa of the vocal cords is supplied by branches of the superior laryngeal and thyroid arteries innervated by sympathetic fibers from the superior cervical sympathetic ganglion. Disruption of this sympathetic innervation may cause vasodilatation, congestion and oedema of the laryngeal mucosa, and voice change.[3]

As our patient did not develop hypotension, cerebral hypoperfusion and its consequences are unlikely causes. Although UDP in a pregnant patient can lead to sufficient CSF leakage to reduce CSF pressure and cause VFP, this takes a few days to weeks to recover. Vocal cord oedema is unlikely to recover so rapidly without specific treatment. Opioids as a cause are likely be associated with dysphagia and tingling. The transient nature of the symptoms suggests the probable cause of voice change to be paralysis of the intercostal and abdominal muscles.

Voice change after SAB can occur due to a variety of causes, some of which are potentially life threatening. Thus, vigilant monitoring and maintenance of oxygenation and haemodynamic stability are of paramount importance. Persistence of postoperative voice change mandates neurological evaluation to rule out central and peripheral causes.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be

reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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