EDITORIAL VIEW

Labor analgesia for the parturients with scoliosis, prior spinal surgery and spina bifida

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Although a large majority of parturients reporting for labour to hospitals will belong to a young 'healthy' group of population and fall in ASA-I category, some may present with prior surgeries, which may be related to their reproductive endeavors or otherwise. Only a small percentage of this later group may have had spinal surgery. Another entity of parturients will report with some sort of spinal deformities, predominantly scoliosis and to a lesser extent spina bifida. Again a large majority of these will deliver their babies without any analgesia being offered to them, except perhaps a shot of inj. pethidine or nalbuphine. Anesthesiologists will come into play when a parturient will request for a painless delivery or is scheduled for a Cesarian delivery, and general physical examination reveals that the parturient has that specific condition of her spine. It may well be noticed only after the lumbar area of the parturient is exposed for an epidural. Now, it is the time for the anesthesiologist to ponder about what chances of successful administration of a painless delivery or a Cesarian section are there and whether to proceed with the epidural or spinal analgesia or not?

Scoliosis is defined as a lateral curvature of the spine and is present in 2% of general population[1] with the prevalence in women twice than in men[2]. Severity of the scoliosis is defined by "Cobb angle". More than 400 angle is considered severe with associated cardiac and pulmonary dysfunction[3]. Some of these patients may have undergone spinal surgery (e.g. Harrington rod insertion) to correct their spinal curvature.

These patients requiring obstetric anaesthesia services require full evaluation of their disability and any associated ailment and should be referred early in the preoperative anesthesia clinic for evaluation of any associated cardiopulmonary and musculoskeletal disease and evaluation of operative and radiographic reports in assessing the location and extend of vertebral anomalies.

Discussion with the patient and family of different options of labor analgesia available is important and must include an explanation of risks and benefits of the labor epidurals, if this option is offered to the parturient. All such proceedings must be recorded in the client file. Counseling for the possible failures of techniques and the alternatives offered is also important and should be documented as stressed in a case report by Dr. A. Majeed and his colleagues in this issue[4].

Challenges faced by the anesthetist in providing neuraxial analgesia for patients with or without corrective surgery range from inability to identify the epidural space, multiple attempts before catheter insertion, patchy analgesia or subdural local anesthetic infusion to accidental dural puncture[5].

There may be multiple anatomic anomalies leading to these challenges. There may be distortion or absence of spinous processes, which are the key landmark of placement of neuraxial anesthesia; therefore palpation is not always the best method for the identification of space. In uncorrected scoliosis, there is deviation of the midline of the epidural space towards the convex aspect of the scoliosis relative to the spinous process. If the parturient had had corrective spinal surgery involving decortication of vertebrae and removal of spinous processes along the extent of the curve, the identification of the space will definitely be very difficult or even impossible by traditional method[6]. Matters may be made even worst by the scar tissue in a post surgical patient and bone grafts can hinder the entry of neuraxial needles into the desired space[7]. Patient with Harrington rod fixed are unable to flex their spine. Postoperative adhesion or obliteration of the epidural space can interfere with local anesthetic spread and increase chances of inadvertent dural puncture[8,9], patchy or unilateral analgesia and/or inadequate anesthesia.

One must ponder 'is neuraxial technique possible in these patients?' before taking a hasty decision. Despite of the

above-mentioned difficulties, successful spinal and epidural have been reported in parturients with corrected and uncorrected scoliosis. Literature review identified 22 articles, including 19 case reports, 2 retrospective reviews, and one prospective observational study[5]. Overall, 117 neuraxial anesthetic procedures were attempted in 103 patients (24 in uncorrected and 93 in corrected patients). Despite the difficulties, more than two third of the patients in both groups were successfully managed with neuraxial techniques[5].

Ultrasonography has been proved to be a helpful tool in defining the relevant anatomy at the time of initiation of neuraxial anesthesia[10] and is increasingly being employed even in routine procedures in the developing countries. The future practices warrant that anesthesiologists of developing countries start learning the use of ultrasonography for this purpose now.

In the uncorrected patient, it is advisable that the needle is oriented towards the convexity of the curve where the interlaminar spaces are generally larger[5]. Still the possibility of a unilateral block will remain. In that case, patient can be placed in the lateral position with the less blocked side in the dependent position[11]. In case of patchy block large volume /low concentration local anesthetic may overcome the problem and placement of additional epidural catheter at the level of the unblocked dermatome has been described[12]. The absence of scarring within the intrathecal space ensures unhindered spread of local anesthetic in post spinal surgery patient. The dose of spinal anesthetic should be reduced to half, if is used after a failed epidural[13].

Spina bifida is the most common clinical presentation of neural tube defect that has birth incidence of 1/1,000.[14]

Spina bifida describes a group of group of condition that is generally categorized into spina bifida oculta and spina bifida cystica.

Spina bifida occulta arises when the two halves of the vertebral arch fail to fuse in the midline. The spinal cord and nerve roots are normal, and as the name implies, there is no external lesion. Spina bifida cystic, on the other hand, is a more severe form and is defined as failed closure of neural arch with herniation of meninges (meningocele), the meninges and neural elements (meningomyelocele) or failure of neural folds to fuse (myeloschisis). Extensive medical history should be taken as these patients may have coexisting anomalies or defects in the genitourinary, respiratory, musculoskeletal and cardiovascular systems.

The degree of neurological impairment must be precisely defined in all of these conditions. Imaging (plain radiographic, computerized tomography and/or magnetic resonance) studies (ideally obtained before pregnancy) will delineate the exact location of the spinal defect, its extent, and will provide some guidance for the placement of epidural for labor[14].

Literature on providing labor analgesia for these patients is limited to a handful case reports and case series; hence, there are no specific guidelines for this particular modality. In patients with spina bifida occulta, spinal and epidural techniques are usually uncomplicated. However, it is recommended to perform the block above the level of the lesion[15].

Tidmarsh and May[16] conducted retrospective reviews of the anesthetic management during labor of 16 such patients. The authors concluded that the conduct of epidural analgesia in patients can be technically difficult and results often unpredictable (e.g., excessive cranial/ poor perineal spread of local anesthetic and /or asymmetric block (16). To ensure safe painless labour, other options of analgesia for patients with scoliosis, prior spinal surgery and spina bifida must be considered as dictated by the circumstances. These patients need to have detailed discussion on different available options of labor analgesia and informed consent obtained[4]. Neuraxial technique is the ideal method of pain relief but option of systemic opioid can be utilized in cases when it is refused by patients, inadequate or technically impossible. PCA is recommended for intravenous opioids. The commonly used opioids for intravenous PCA are fentanyl and remifentanil.

CONCLUSION

Providing labor analgesia to patients with spinal deformities and prior spinal surgery poses unique challenges to the obstetric anesthesiologists. Every patient needs to be individualized and needs to be assessed in the preoperative clinic for associated medical problems and the nature and extent of the lesion. Understanding the anatomic anomalies in these patients helps in the institution of neuraxial anesthesia. Since regional technique is the ideal method of labor analgesia, these patients should be given a trail after proper planning. Informed consent is a must; and radiological assistance is helpful in most of these patients.

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