REVIEW ARTICLE

The causes, prevention and management of post spinal backache: an overview

Mohammad Kashif Rafique, FCPS*, Arshad Taqi, FCPS*

**Consultant Anesthesiologist, Hameed Latif Hospital, Lahore (Pakistan).*

Correspondence: Dr. Arshad Taqi, Consultant Anesthesiologist, Hameed Latif Hospital, Lahore (Pakistan); e-mail: arshadtaqi@gmail.com

SUMMARY

Back pain is one of humanity's most frequent complaints, a common reason for physician visits and a major psychological, physical and economical burden. Although the frequency of backache is as high as 46% even after general anaesthesia, it was the major cause for 13.4% patients refusing spinal anaesthesia. Multiple factors are involved in the pathogenesis of postoperative back pain and include type and duration of surgery, duration of immobilization, and the position of the patient during spinal puncture. Diagnosis of back pain is not simple; contributing factors may include needle trauma, surgical positioning, and injection of saline or local anaesthetic into the interspinous ligaments, development of a supraspinous hematoma, excessive stretching of ligaments after relaxation of paraspinal muscles and localized trauma to the intervertebral disc. Its relationship with various types and sizes of spinal needle is yet to be confirmed. Some preventive aspects have been discussed. Acute post spinal backache usually resolves within 7 days without any treatment but the possibility of epidural abscess or epidural hematoma must be ruled out. Counselling, hot and cold massage, mild analgesics like paracetamol or topical NSAIDs ointments may be prescribed.

Key words: Backache; Postoperative back pain; Spinal needle; Transient neurologic symptoms

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INTRODUCTION

Backache is a common public health problem and a major psychological, physical and economical burden for the individual and the society,[1-2] . Back pain is one of humanity's most frequent complaints and a common reason for physician visits. It is estimated that nine out of ten adults experience backache at least once in their lifetime, and five out of ten working adults have back pain every year. No comprehensive data exist for its prevalence in our population but it is almost the same as in the western population if not more.

Back pain after surgery may result from a multitude of causes that include posture during surgery, aggravation of an existing medical condition or needle trauma during central neuraxial blocks,[3-4]. In rare cases this may by the manifestation of a sinister condition like epidural abscess or haematoma following a central neuraxial block.[5]

INCIDENCE

A significant number of patients complain of backache following anaesthesia and surgery. Although the frequency of backache is as high as 46% following general anaesthesia[6], the patients relate this to their anaesthesia if they have undergone a central neuraxial block; the myth of invariable injury to the back associated with needles [7]. Backache following previous spinal anaesthetic was the major cause for 13.4% patients refusing spinal anaesthesia in a series of more than 1000 patients[8].

Symptoms varying from "pricking sensation" at the site of needle insertion, upper or lower back pain or pain radiating to the buttocks and legs are all sometimes reported as backache. 26.6% of more than 100 patients studied by Chan complained of injection site tenderness lasting less than a week, which should be differentiated from classical "backache" that none of them complained[9].

Confounding variables like pre-existing backache; duration of surgery and the patient's posture during surgery compound the issue. The pain could be of a short duration, lasting from 72 hours to a week or persistent, lasting beyond 3 months.

431 out of 918 pregnant patients surveyed by Shaheen and colleagues had at least one episode of backache during their pregnancy; 96 out of these had experienced backache before they became pregnant. This indicates that about half of these patients would have a preexisting backache if they presented for spinal anaesthesia for Caesarean delivery[10].

Controversy exists over the relationship between anaesthetic technique and the true incidence of postoperative back pain. Regardless of anaesthetic technique, back pain was seen in almost 25% of the patients who underwent surgical operations under general or spinal anaesthesia,[11-12]. Randel and colleagues at the University of Michigan compared the recovery characteristics of three anaesthetic techniques for outpatient orthopaedic surgery. One of the parameters they measured was post operative back pain and they found that epidural followed by spinal and then general anaesthesia had highest incidence of back pain on first post operative day but by the third post operative day the difference of back pain in these three techniques was not statistically significant. No patient in this study required any specific treatment for backache[13].

PATHOPHYSIOLOGY

An overview of the anatomical structures involved may help understand the nature of post spinal anaesthesia back pain. The back is a complex structure with an intricate network of bones, joints, muscles, ligaments, with multi level crossovers in nerve supply as well as muscular and ligamentous attachments. The multiple subdivisions of muscle mass, numerous connective tissue planes, and multiple attachments of tendons over small areas of vertebral periosteum help to explain the prevalence of neck and back pain while simultaneously explain the difficulty in precisely localizing the source of that pain. Branches of the posterior ramus provide sensory fibres to fascia, ligaments, periosteum, and facet joints.

Source of traumatic low back pain may be the vertebral column itself, surrounding muscle, tendons, ligaments, and fasciae, or a combination thereof. Taking into account this difficulty in identifying muscle and tendon injury as the source of pain and the fact that there are other generators of low back pain besides muscles (e.g., fasciae, ligaments, facet joint, intervertebral disc), it becomes clear that diagnosis of back pain is not simple. Deyo and colleagues have pointed out that source of acute low back pain cannot be identified in 85% of patients[14] (Table 1).

Multiple factors are involved in the pathogenesis of postoperative back pain and include type and duration of surgery, duration of immobilization, and the position of the patient during spinal puncture[15]. Other contributing factors include needle trauma, surgical positioning, injection of saline or local anaesthetic into the interspinous ligaments and development of a supraspinous hematoma, [16-17]. Excessive stretching of ligaments after relaxation of paraspinal muscles and localized trauma to the intervertebral disc has also been implicated in causing back pain[18].

Persistent Postoperative Back Pain: Schwabe and Hopf studied persistent back pain after spinal anaesthesia in the non-obstetric setting using questionnaires at 3 months and then after 1 year of spinal anaesthesia in 245 patients. Percentage of patients complaining of backache in their study was comparable with the average from 11 studies they referred to (15.4% vs 18%). Pre-existing back pain was the only variable associated with persistent back pain after 3 months of spinal anaesthesia. Most of these patients did not link their post-operative complaints of low back pain to the spinal anaesthetic[19].

Table 1: Pain sensitive tissues in the spine

Pain sensitive tissues in the spine
• Skin, subcutaneous tissue, and adipose tissue
• Capsules of facet and sacroiliac joints
• Ligaments: longitudinal spinal, interspinous (mainly posterior), and sacroiliac
• Periosteum
• Dura mater and epidural fibroadipose tissue
• Vasculature; both arterial and venous
• Paravertebral muscles

Backache and transient neurological symptoms

Postoperative back pain is sometimes confused with transient neurological symptoms. Lignocaine has been implicated as a possible cause of temporary and permanent neurologic complications after spinal anaesthesia in many case reports. Follow up of patients who received uncomplicated spinal anaesthesia revealed that some of them developed pain in the lower extremities after an initial full recovery. This

painful condition that occurs in the immediate postoperative period was named 'transient neurologic symptoms' (TNS).

Frequency of TNS and neurologic complications after spinal anaesthesia with lignocaine compared to other local anaesthetics was studied in a Cochrane review that looked at sixteen trials reporting on 1467 patients, 125 of whom developed TNS. The use of lignocaine for spinal anaesthesia increased the risk of developing TNS. There was no evidence that this painful condition was associated with any neurologic pathology; the symptoms disappeared spontaneously by the fifth postoperative day.

In another study, the relative risk (RR) for developing TNS after spinal anaesthesia with lignocaine as compared to other local anaesthetics (bupivacaine, prilocaine, procaine, levobupivacaine, ropivacaine, and 2-chloroprocaine) was 7.31 (95% confidence interval (CI) 4.16 to 12.86). The authors concluded that the risk of developing TNS after spinal anaesthesia was significantly higher with lidocaine as compared to bupivacaine, prilocaine, or procaine[20]. Risk of TNS with lignocaine does not change when concentration of lignocaine is reduced from 5% to 2%[21].

Anaesthetic factors influencing postoperative backache

The data on post spinal analgesia consists of observational studies looking at the effect of variables like needle size, design and technique on the outcome, which is largely success rate and postdural puncture headache. Postdural puncture backache (PDPB) is largely included as another variable that is not studied closely; a large array of complaints ranging from pain at the site of injection to classical backache or pain radiating to the lower limbs are lumped together as backache. Complete neurological evaluation to determine the cause is largely not documented in these studies[22].

Needle Type and Size: Type and size of spinal needle used for subarachnoid block has been studied extensively. A survey conducted on 274 patients undergoing spinal anaesthesia using 23 or 25 gauge spinal needles found no difference in the incidence of postoperative backache between the groups[23]. Kandg and colleagues compared 26 and 27 gauge needles for spinal anaesthesia in a large population of 730 ambulatory surgery patients. They noted 18-20% incidence of postoperative back pain in the two groups which was not statistically significant[24]. Tarkkila and colleagues compared Sprotte needle with Quincke needle for frequency of postoperative headache and backache in 300 ASA physical status 1 and 2 patients undergoing minor orthopedic or urologic procedures in their randomized, prospective trial. Backache was the most common complication, occurring in 18% patients with no difference between the two groups studied. Sprotte needle did not demonstrate any advantage in reducing the incidence of post dural puncture headache or backache[25]. Atraucan needle was compared with Sprotte and Quincke needles in a study that failed to demonstrate superiority of any one type of spinal needle in reducing the incidence of postoperative back pain[26].

Lowery and Oliver studied the incidence of postdural puncture headache and backache following diagnostic/therapeutic lumbar puncture using a 22G cutting spinal needle, and after introduction of a 25G pencil point spinal needle in 99 pediatric patients. They reported post procedure back pain in 11% of patients in the 22G Quincke needle group while none in the 25G pencil point needle group. These finding, although overwhelming, are not supported by data from adult literature[27].

Rebekah and colleagues compared the back pain and patient satisfaction scores after the administration of a spinal anaesthetic with or without the use of an 18 gauge introducer needle in 84 patients. They failed to demonstrate a difference in back pain or patient satisfaction scores on discharge from post-anaesthesia care unit or 24, 48 and 72, hours postoperatively. Significant increase in the number of redirections between groups was observed in the non-introducer group, which did not affect the results [28].

Technique: Wilder-Smith prospectively followed 697 patients operated under spinal anaesthesia to determine the incidence and contributing factors predisposing to post-spinal anaesthesia backache. Backache was reported by one out of every seven patients (13.1%), which is comparable to frequency of post-spinal headache. They determined that this often neglected additional cause of post-spinal morbidity can be reduced by the use of atraumatic techniques and with small-gauge spinal needles for performing lumbar puncture[29].

Shutt and colleagues compared 22G and 25G Whitacare needles with 26G Quincke needles. It was a controlled study of 150 women undergoing elective Caesarean delivery under spinal anaesthesia in which effect of number of needle insertions on the postoperative complication rate was assessed. The significant difference between groups ($P < .001$) was attributable entirely to the number of patients reporting backache after more than two attempted

needle insertions. The increased incidence of backache following repeated spinal needle insertion was presumed to be due to soft tissue or periosteal trauma. No backache was sufficiently severe to be followed beyond 72 hours after the operation[30].

PREVENTION

Needle size and design do not influence the likelihood of a patient developing postoperative backache. Number of attempts made before a successful block increase the risk of trauma and likelihood of postoperative backache. Avoiding neuraxial blocks while a patient is receiving antiplatelet increases the risk of epidural haematoma with resulting acute back pain and neurological injury. There is little evidence to suggest an association between persistent backache and spinal anaesthesia; almost all of these patients have a history of at least one episode. This history should be sought during preanaesthetic interview and the patients reassured about this lack of association before administering them spinal anaesthesia.

MANAGEMENT

Acute post spinal backache is a self limiting condition that resolves within 7 days without any treatment in most patients but the symptoms overlap with those of serious neurological complications like epidural abscess or epidural hematoma. Conservative management may be instituted after serious causes of back pain have been ruled out. Patient should be counselled about the reversibility of the condition. Hot and cold massage mild analgesics like paracetamol or topically NSAIDs ointments may be prescribed. A follow up would be advisable to rule out persistent backache that requires more extensive workup and management.

CONCLUSION

Incidence of PDPB is almost the same as postdural puncture headache (PDPH). In contrast with PDPH, which is a direct consequence of the technique, there is little data to attribute PDPB to dural puncture; exception being serious conditions like epidural abscess, haematoms and meningitis. PDPB can result from a multitude of causes that include patient's positioning during surgery, length of surgery and pre-existing backache. It is a self-limiting condition that responds to conservative management. There is, however, an established association between intrathecal lidocaine and TNS. We recommend seeking a thorough history for pre-existing backache from all patients receiving spinal anaesthesia; complaints of new onset backache after spinal anaesthesia should be investigated for serious causes like epidural haematoma or abscess before the patients are reassured and symptomatic management ensued. Back pain persisting for more than one week should be referred for further investigations.

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