

CLINIQUIZ

Complications of neuraxial anesthesia

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A 25 year old moderately obese parturient is administered spinal anesthetic with 25G spinal needle in a single prick with 2 ml of inj. bupivacaine (0.5% heavy) for cesarean section. The next morning (approximately after 15 hours of surgery) patient complains of severe headache in occipitofrontal region, aggravated with upright posture and consistent with the diagnosis of post dural puncture headache (PDPH). (Please select one best answer)

Q. 1: Regarding post dural puncture headache which of the following statement is incorrect?

- a) Application of abdominal pressure will produce transient relief
- b) The incidence following dural puncture with 23G needle is nearly 10-30% in parturients
- c) Post-anesthesia, early ambulation increases the risk of PDPH in parturients
- d) Whitacre needles produce greater inflammatory reaction leading to reduction in CSF leak

Q. 2: All of the following measures can reduce the incidence of PDPH except:

- a) Spinal needle with pencil tip
- b) Orientation of the bevel parallel to the dural fibres in cutting needles
- c) Direction of the needle axis perpendicular to the dura
- d) Single prick in dura

Q. 3: All of the following are effective in the management of PDPH except:

- a) Valsalva maneuver
- b) Desmopressin (DDAVP)
- c) Cosyntropin
- d) Abdominal binder

Q. 4: Regarding epidural blood patch which of the following statements is correct?

- a) During epidural blood patch, 15 ml of blood injected in epidural space is sufficient to provide spread over a mean distance of 9 spinal segments
- b) The spread of blood in epidural blood patch is more towards caudal than in cranial direction
- c) The success rate of epidural blood patch is 60-65%
- d) The mass effect of the blood persists beyond 24-36 hours

Q. 5: All of the following are true regarding cauda equina syndrome except:

- a) Saddle anesthesia in perianal region
- b) Exaggerated lower limb reflexes
- c) Can occur following lumbar disc herniation, arachnoiditis or spinal anesthesia
- d) Sphincter dysfunction resulting in fecal incontinence and urinary retention

Q. 6: During epidural catheter placement, accidental subarachnoid injection of massive dose of local anesthetic may lead to all of the following except:

- a) Pupillary dilatation
- b) Bradycardia with severe hypotension
- c) Respiratory arrest due to phrenic and intercostal nerve dysfunction.
- d) Unconsciousness with cranial nerve involvement

Q. 7: One of the following is a feature of an inadvertent subdural injection:

- a) Rapid onset of action with an exaggerated spread after attempted epidural injection
- b) Onset of respiratory and cardiac insufficiency is delayed
- c) Extensive and patchy sensory block, with far less extension of motor and sympathetic block
- d) Rapid offset of block is common

Q. 8: The features of transient neurological symptoms (TNS) include all of the following except:

- a) Back pain and/or dysesthesia radiating bilaterally to the legs or buttocks after total recovery from spinal anesthesia and beginning within 24 hours of surgery
- b) Decreasing the concentration of lidocaine from 5% to 2% prevents the development of TNS
- c) Changing the baricity of local anesthetic solution (from hyperbaric to hypobaric) does not decrease the risk of TNS
- d) The incidence of TNS is higher after knee arthroscopy surgery

Q. 9: Which of the following is a feature of epidural abscess?

- a) Onset within 1-2 days of epidural catheter placement
- b) Presence of flaccid paralysis in early stage

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- c) Bowel and bladder symptoms are characteristically absent
- d) Segmental reflexes are obtunded initially

Q. 10: Which of the following is an incorrect statement regarding local anesthetic (LA) toxicity:

- a) The possibility of systemic toxicity following intrathecal administration of LA is extremely low
- b) The cardiovascular system is more resistant than the CNS to the toxic effects of local anesthetics
- c) Local anesthetics primarily affect cardiac electrical activity while the cardiac contractility is well preserved
- d) Rapid infusion of lipid emulsion can effectively reverse LA toxicity

Answers

Ans. 1 (c): Gutsche sign: The application of firm manual pressure around the abdomen of the seated patient produces transient relief. Early ambulation or continuous spinal anesthetic administration via spinal microcatheters has not shown to increase the incidence of PDPH as thought earlier. Though, once PDPH is developed it is advised to limit ambulation or sitting in upright posture. Whitacre needles produce more trauma, as evidenced by electron microscopy images, and the reduced loss of CSF may be a result of an 'edematous plug' resulting from inflammatory reaction.

Ans. 2 (c): The arachnoid is closely adherent to the dura, and when a needle is advanced perpendicularly, the holes made by the bevel in the dura and arachnoid regions are directly in line with one another, promoting CSF leakages. When a needle is directed obliquely, the dural hole does not line up with that in the arachnoid layer, thus obstructing CSF leakage.

Ans. 3 (a): The therapies involved in the management of PDPH include bed rest, hydration, oral fluids, 5HT₁ receptor agonists (Sumatriptan, Zolmitriptan, etc), NSAIDs, caffeine, DDAVP and theophylline. Coughing, Valsalva maneuver, straining and sneezing increase the severity of PDPH.

Ans. 4 (a): Spread of 15 ml of blood is more towards cranial (6 spinal segments) than caudal direction (3 segments) as reflected by radionuclide studies. The success rate for a first EBP is 85%, and 98% after a second patching. The mass effect of epidural blood clot persists beyond 3 hours, and clot resolution occurs in 7 hours.

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Ans. 5 (b): Lower limb weakness and depressed reflexes are observed followed by rapid onset of paraplegia. Treating patients within 48 hours after the onset of the syndrome provides a significant advantage in improving sensory and motor deficits as well as urinary and rectal function.

Ans. 6 (c): The subdural space extend from floor of 4th ventricle to 2nd sacral vertebrae (both intra- and extra cranially). All of the above complications can occur following massive local anaesthetic administration intrathecally but respiratory arrest occurs due to ischaemia to vital centres following prolonged hypotension and delayed resuscitation.

Ans. 7 (c): Most case reports of subdural injection during attempted spinal anesthesia describe negative aspiration, negative test dose, followed by a delayed onset (5 to 30 minutes or more) of an extensive sensory block (often including cranial nerves) and delayed offset. Subdural injection is confirmed by observing the typical "railroad track" or "honeycomb" pattern after injection of contrast material. Treatment involves cardiorespiratory support until the block recedes. Full motor, sensory, and sympathetic recovery are the norm.

Ans. 8 (b): Transient neurological symptoms (TNS) have been shown to occur following intrathecal administration of varying doses of lignocaine from (0.5%-5%) and different baricity. MRI studies have confirmed the presence of perineural inflammation in these cases. Associated factor in TNS include patient positioning (Trendelenberg or Jack knife).

Ans. 9 (b): Clinical features following epidural abscess include a history of neuraxial blockade within few days to weeks, history of immunosuppression or infection, fever, back pain, localized tenderness, spinal ache and root pain, exacerbated segmental reflexes, motor weakness and eventual paralysis. Signs of extradural compression are seen on CT myelogram and urgent surgery is warranted.

Ans. 10 (c): Systemic toxicity with LA commonly occurs following intravascular absorption of large dose intended for epidural use. CNS symptoms are predominant but cardiac changes can also occur in high doses and more with the use of Bupivacaine which can cause resistant Ventricular Fibrillation (torsades de pointes). Both electrical and mechanical cardiac activities are compromised. Rapid infusion of intralipid 20% @ 1.5 ml/kg over 1 min followed by 0.25 ml/kg/min infusion has shown to reverse the local anesthetic toxicity in many case reports.