No Sensory Block with Spinal Bupivacaine a Case Report

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We report a case in which 2 cc of 0.5% plain bupivacaine was injected intrathecally in the lateral position at the level of L2–L3 interspace, as a result of which motor and sympathetic blockade developed, and mild paraesthesia (partial sensory blockade). We speculate that in this case plain bupivacaine acted as hypobaric solution and after repositioning of the patient into the supine position the solution passed anteriorly, blocking the motor and sympathetic roots, but not completely blocking the sensory (posterior) roots.

Report of a Case

A 68 year old man, was admitted to our hospital for elective prostatectomy. Relevant medical history noted that the patient suffered from non insulin dependent diabetes mellitus (controlled only by diet) and chronic bronchitis due to heavy smoking.

Twenty years prior to the present admission he had undergone an elective cholecystectomy under general anaesthesia without complications.

Preoperative X-ray of the chest and routine laboratory investigations were normal.

His weight was 75 kg and height 172 cm. The patient was premedicated with morphine 10 mg and promethazine 25 mg intramuscularly 40 min before the operation.

One litre of Ringer's lactate solution was infused prior to initiating the block.

In the lateral position, a lumbar puncture was performed at the L2–L3 interspace. When the subarachnoid space was identified, by the free flow of cerebro-spinal fluid, 2 cc (10 mg) of 0.5% plain bupivacaine was injected. Immediately thereafter the patient was turned into the supine position and a pillow was placed under his head. Oxygen via a non-rebreathing face mask was administered.

Four minutes after initiating the block the patient exhibited signs of both sympathetic and motor blockade. Blood pressure decreased from 180/90 to 160/85 mmHg and the skin temperature of the lower limbs remarkably increased with respect to the upper half of the body. Complete motor blockade [Bromage grade 3^{12}] was developed within 12 min. We examined the level of the sensory blockade with pin-prick. There was mild paraesthesia, but no sensory blockade at the level of Th-8.

Fifteen minutes after initiating the block, while continuing administration of fluids intravenously, the patient's blood pressure fell further to 140/70 mmHg. Full motor blockade of the lower limbs, paraesthesia and absence of sensory blockade were observed. Having received a total intravenous fluid volume of two litres, the patient's blood

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pressure further decreased to 120/90 mmHg.

General anaesthesia was induced with sodium thiopenthal 4 $mg \cdot kg^{-1}$, suxamethonium 1 $mg \cdot kg^{-1}$, and following intubation, anaesthesia was maintained with nitrous oxide and oxygen, analgesia – with fentanyl, and neuro-muscular blockade – with pancuronium.

Blood pressure measurement was in the range of 120/80 mmHg and heart rate was 62–82 beats per mimute. The duration of the operation was 100 min, whereafter reversal of the neuro-muscular blockade was performed with prostigmine and atropine, and the patient was extubated.

Ten minutes after extubation the patient complained of pain at the wound site and received morphine 10 mg intramuscularly. Persistence of the motor blockade (Bromage scale grade 3) and absence of sensory blockade was noted. Five hours after surgery the patient continued to reveal signs of motor blockade (Bromage scale grade 2). An hour thereafter full recovery was noted.

Discussion

Subarachnoid injection of bupivacaine produces spinal anaesthesia: sympathetic, sensory and motor blockade[1–10]. The height and intensity of this blockade depend on age of patient[1], baricity[2], body mass[3], performance of barbotage[4], volume, and total mass of the local anaesthetic agent[5,7,8] and density[6].

The level of sensory blockade is usually 2–3 segments cefalad to that of motor blockade[11]. This level of sensory blockade is determined by pin-prick, and that of motor blockade is graded according to the Bromage scale[12].

Cocaine 0.125% injected intrathecally is known to produce sensory blockade in the absence of motor blockade. Higher concentrations of cocaine produce both motor and sensory blockade[13].

Hence only sensory blockade developes with lower concentrations of Cocaine. In order to produce motor blockade larger concentrations of this local anaesthetic are required. The difference in concentration required to produce a motor block as opposed to a sensory block has not been clearly defined for lidocaine or bupivacaine[13].

It is known, that chronic pain in the cancer patient can be treated by injecting a hypobaric absolute alcohol solution in a small volume intrathecally, without the patient lying in a specific position. In this case lysis of sensory nerves can be achieved without affecting the motor roots[14]. Such results have not been reported after injection of plain (isobaric) bupivacaine.

We find ourselves unable to explain the outcome of the differential blockade in this particular case. It is known that the baricity of plain bupivacaine depends upon its temperature. In our clinic bupivacaine is stored in an induction room at a temperature of 17–22°C. At this temperature plain bupivacaine is slightly hypobaric. In clinical practice intrathecal injection of plain bupivacaine results in reliable sympathetic, sensory and motor block independent of the patient's position[9]. We speculate that in this case plain bupivacaine acted as a hypobaric solution and after repositioning of the patient the solution passed anteriorly, blocking the motor and sympathetic roots, but the sensory (posterior) roots were only partially blocked and mild paresthesia was present.

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