

It is important to keep in mind that hypotension, by decreasing the respiratory centre perfusion, can produce apnoea as effectively as a high motor block. The only difference is in the time it lasts.

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REFERENCES

- 1 Palkar NV, Boudreaux RD, Mankad AV. Accidental total spinal block: a complication of an epidural test dose. *Can J Anaesth* 1992; 39: 1058–60.
- 2 Fortuna A, Fortuna AO. Complicações e acidentes em bloqueios regionais (anestésias requídeas e paeridural). *Rev Bras Cir*, 1989; 79: 5–10.
- 3 Greene N. *Physiology of Spinal Anesthesia*, 3rd Ed, London: Williams & Wilkins, 1981. 126

REPLY

Thank you for giving us the opportunity to respond to Dr. Fortuna's comments.

It is possible that apnoea in this patient can partly be from hypotension and brainstem hypoperfusion, but she did develop flaccid paralysis in her upper extremities which means that motor paralysis in the cervical region had, indeed, taken place. The block, however (both sensory and motor), started regressing fairly quickly. The clinical picture developed with remarkable speed and consequences could have been disastrous. Understandably, therefore, we were occupied by measures at resuscitation and saving the baby. We are not, therefore, sure if the actual recovery of the block coincided with the restoration of blood pressure or it was "spontaneous."

Measures were taken to avoid aorta-caval compression in the mother. She was placed in the left lateral recumbent position until the baby was delivered.¹

"Total Spinals" do occur accidentally after a massive epidural dose of local anaesthetic gets into the subarachnoid space. Whether our case can or cannot be called a "total spinal" is of academic interest only. The purpose of our report was to emphasize the importance of being watchful, to recognize and treat the consequences of a neuraxial block (or a test dose) in a parturient as speedily as possible to prevent any long-lasting deleterious effects on the mother or her infant.

We chose to administer a general anaesthetic to our patient for the following reasons: (1) by the time she was being transferred to the OR, the block (both sensory and motor), was receding and since only 45 mg of lidocaine had been used, we were not sure if this would provide adequate analgesia for the surgery. (In our institution, the operating time for C-sections is about one hour.) (2) This patient exhibited an unusual response to 45 mg lidocaine. We, therefore, did not consider it appropriate, at this time, to try another dose or another local anaesthetic agent. (3) The foetus had developed foetal distress (FHR ~ 60 min⁻¹ with late decelerations) and the quickest way to deliver the baby is by administering a general anaesthetic.

We thank Dr. Fortuna for showing interest in our case report.

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REFERENCE

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Accidental total spinal block (2)

To the Editor:

In their discussion of the possible cause of the total spinal block following an "epidural" test dose of 1.5% lidocaine 3 ml with epinephrine 1:200,000 15 µg, the authors did not consider iso- or hypobaricity of the anaesthetic in a sitting patient and a cephalad-threaded catheter.¹ In 30 healthy, nonfasting parturients, cerebrospinal (CSF) specific gravity ranged from 1.0009 to 1.0063.² Although the patient described had received one litre of *iv* electrolyte solution, she most likely had been fasting for some time raising her CSF specific gravity to the upper range. The specific gravity of 1.5% lidocaine is 1.0064 at room temperature (25°C), but the specific gravity of drugs is consistently lower at body temperature (37°C). Thus, the specific gravity of 2% chloroprocaine CE measures 1.010 at 25°C, but 1.0044 at 37°C.³ Since a small volume of drug injected into the CSF at room temperature approaches body temperature within seconds,⁴ one may assume that the lidocaine specific gravity in this case was at a low level.

A similar complication was repeated following accidental intrathecal injection of 2.5 ml of 2% chloroprocaine through a cephalad-threaded catheter in a parturient in a head-up position.³ Since most local anaesthetics are hypobaric at body temperature, test doses should not be administered with the patient in a sitting position when administration of the block is difficult.

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REFERENCES

- 1 Palkar NV, Boudreaux RC. Accidental total spinal block: a complication of an epidural test dose. *Can J Anaesth* 1992; 30: 1058–60.
- 2 Marx GF, Orkin LR. Cerebrospinal fluid proteins and

spinal anesthesia in obstetrics. *Anesthesiology* 1965; 26: 340–53.

- 3 Kim YI, Mazza NM, Marx GF. Massive spinal block with hemiparalysis after a "test dose" for extradural analgesia. *Anesthesiology* 1975; 43: 370–2.
- 4 Etherington-Wilson W. Specific gravity of the cerebrospinal fluid. *BMJ* 1943; 2: 165–7.

REPLY

Thank you for giving us the opportunity to respond to Drs. Foster and Marx's letter.

Lidocaine 1.5% with epinephrine, as used by us in the patient in question¹ is reported to be "isobaric" by the manufacturers. We agree that this solution would become hypobaric at body temperature. Some of the signs and symptoms in our patient can be explained by this phenomenon.

We also agree with these authors recommending that epidural test doses should not be administered with the patient in a sitting position when the administration of the block is difficult.

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Accidental total spinal block (3)

To the Editor:

I would like to challenge the statement by Palkar *et al.*¹ that 15 µg epinephrine must be added to epidural test solutions to rule out intravascular injection. Although this may well be true for young, calm or premedicated adult surgical patients not receiving β-blockers, this cannot be extrapolated to other patient groups such as pregnant, in particular, labouring women.

In order to be clinically useful, an intravascular injection of an epinephrine containing test dose must consistently produce tachycardia in a patient who has an otherwise stable heart rate. Chestnut² found that 50% of labouring women had at least one spontaneous heart rate acceleration during the period of epidural placement. Injecting either saline or 15 µg epinephrine *iv* into labouring women Leighton³ found the heart rate response to be neither specific nor sensitive. In the group receiving saline, 20% had an increase in heart rate, yet only 50% of those actually given epinephrine showed an increase.

In addition, the test dose must be safe, both for the mother and fetus. Hood⁴ showed intravenous solutions

containing 10–20 µg injected into pregnant ewes consistently decreased uterine blood flow to 55–65% of control, but without evidence of fetal compromise. However, Leighton³ demonstrated signs of fetal distress in two of ten patients receiving *iv* epinephrine. In addition, she questioned the safety of epinephrine in pre-eclamptic patients.

Clearly the role of epinephrine in the obstetric epidural is controversial. Many centres, ours included, do not routinely use an epinephrine containing test dose in pregnant patients. The alternatives to test for intravascular catheter placement are either to use an air test dose with a precordial Doppler monitor, or a plain local anaesthetic test dose sufficient to have a reasonable probability of eliciting mild systemic symptoms should *iv* injection occur, without leading to too high a block in the average patient in the event of an unintentional subarachnoid injection. Such a test dose would be 3 ml of 1.5 or 2% lidocaine.

However, as this case report showed, high spinal blockade can occur with as little as 45 mg subarachnoid lidocaine. This illustrates that even the most conscientiously planned test dose does not replace a high index of suspicion regarding catheter placement, slow titration of epidural local anaesthetic, vigilance, and preparedness of the unexpected.

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REFERENCES

- 1 Palkar NV, Boudreaux RC, Mankad AV. Accidental total spinal block: a complication of an epidural test dose. *Can J Anaesth* 1992; 39: 1058–60.
- 2 Chestnut DH, Owen CL, Brown CF, Vandewalker GE, Weiner CP. Does labour effect the variability of maternal heart rate during induction of epidural anesthesia? *Anesthesiology* 1988; 68: 622–5.
- 3 Leighton BL, Norris MC, Sosis M, Epstein R, Chayen B, Larijani GE. Limitations of epinephrine as marker of intravascular injection in labouring women. *Anesthesiology* 1987; 66: 688–91.
- 4 Hood DD, Dewan DM, James FM. Maternal and fetal effects of epinephrine in gravid ewes. *Anesthesiology* 1986; 64: 610–3.

REPLY

We thank Dr. Lucy for showing interest in our Case Report recently published in your Journal.¹ There is no "ideal" test dose and the controversy over its volume and composition still continues.^{2–6} We agree with Dr. Lucy that even the most conscientiously planned test dose does not replace a high index of suspicion regarding the catheter placement, vigilance and preparedness of the unexpected. In fact, Chestnut *et al.*⁶ put