LETTERS TO THE EDITOR

Spinal Anaesthesia for Caesarean Section

Sir,

I read with interest D. Wilkinson's letter *"Low Spinal Anaesthesia for Caesarean Section"*[1] and although I agree with some of his points I have some queries about others.

Although not specified, one may guess that the heavy bupivacaine used is the common 0.5% solution. This should be mentioned as higher concentrations of 0.75% are used in some countries. I share the view that 1.5ml of anaesthetic solution (7.5mg) provides adequate levels of anaesthesia. The same amount is used successfully in Durban[2]. This is in contrast with other South African data[3] of a standard dose of 2.5ml (12.5mg). The latter amount is widely used in developed countries, where it is considered by some[4] that volumes of 2ml or less of heavy bupivacaine 0.5% are followed by an excessive number of inadequate blocks.

It would have been interesting to know the levels of upper sensory block in Wilkinson's experience. Working in similar conditions and with the same population of Zulu women, and using the same amount of anaesthetic solution, our average level of sensory blockade was T4.6 ($\pm$3.2 (median : T4; range : C5-T8, using Keegan and Garrett's non-overlapping dermatome map).

In contrast with Wilkinson, I did not keep the patients sitting after the subarachnoid injection, since other studies[5-6] have reported no effects of posture on the spread of hyperbaric as opposed to plain solutions. Since the main thrust of the letter was a "*low*" spinal obtained by keeping the patients sitting for 5 minutes, it would have been interesting to report the level of blockade to substantiate the relevance of the method. It is also not stated whether the patients were in labour or not. It is generally considered that hypotension is more prevalent and of greater magnitude in elective cases. Only 59 patients had a systolic blood pressure fall by an average of 16%, which is not hypotension by international criteria. Only 5% had a decrease of $\geq$39mmHg. This is surprising and exceptional! In a mixed population of 175 cases (20% elective cases; 14% hypertensive disease of pregnancy) I experienced hypotension <30% or more from baseline and (<90mm Hg) in 37.7%.

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Dear Sir,
In favour of an extra half ml.

We write regarding Dr Wilkinson's description of a low spinal blockade for Caesarean section (Update in Anaesthesia 1996;6:28). This is a technique which we have both used frequently and the comments below partly stem from personal observation. We believe that there are several important caveats that one should be aware of before recommending this technique widely.

1.5mls of 0.5% heavy bupivacaine given in the method described will only give a block to approximately the level of T10. The consequences of this are firstly that a vertical incision may not be anaesthetised at the upper margin and secondly that visceral peritoneal nerve fibres are not anaesthetised: this requires blockade up to the level approximately T-6, as described previously in this journal. Surgery, in particular peritoneal and uterine traction has to be very skilful and gentle if this method is to be effective.

In addition the small volume of local anaesthetic injectate correlates with a shorter duration of surgical anaesthesia and there can sometimes be a regression of block which leads to difficulties towards the end of the procedure; in particular patient discomfort along with significant abdominal muscle tone making wound closure troublesome. Incomplete surgical anaesthesia occurring when surgery is underway can be difficult to manage and potentially disastrous, especially for the sole operator-anaesthetist. This is a real possibility when using such a small amount of local anaesthetic and could easily occur, especially if surgery lasts longer than 30 - 40 minutes, as may be the case with an inexperienced surgeon, or with unexpected surgical difficulties. It is possible that Dr Wilkinson's excellent results are partly due to his speed and skill as a surgeon, although it is interesting to note that 13% of his patients required further agent to supplement the anaesthesia.

Using a larger volume of bupivacaine, for example 2.0 - 2.5mls of 0.5% solution would avoid some of the potential problems outlined above. It must be emphasised however that any spinal anaesthesia, and especially when using larger amounts of local anaesthetic that the usual rules apply. Included in these are that the patient must be fully fluid resuscitated with intravenous fluids and that they should be free of significant cardiac disease. In these situations spinal anaesthesia with a larger amount of local anaesthetic may be dangerous or even fatal.

Although he is rightly worried about the risks of a higher spinal block including hypotension, the level of spread of a heavy solution is limited somewhat by the natural thoracic kyphosis, especially if a pillow is placed beneath the upper body to exaggerate this.

Hypotension can be a problem but is easily treated with appropriate fluid. If necessary a vasopressor such as ephedrine may be used. One ampoule of 30mg can be diluted into a 10 ml syringe with saline and the anaesthetic assistant or nurse can inject boluses of 1 - 2mls as required to elevate the blood pressure. Alternatively one or two ampoules of ephedrine can be added to a bag of intravenous fluid and the rate of infusion adjusted in accordance with the blood pressure.

There can be little doubt that using a smaller dose of local anaesthetic lessens the cardiovascular effects of spinal anaesthesia. We are aware that vasopressors can sometimes be unavailable and that fluid resuscitation is sometimes limited. In these situations Dr Wilkinson's technique may well represent an appropriate compromise.

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Sir,

I feel I must comment on the letter entitled '*Low Spinal Anaesthesia for Caesarean Sections*' in your edition No. 6 of 1996.

The title obviously implies that a low segmental block was being administered yet the level of block is nowhere mentioned, a pity, as such is so easily ascertained by the judicious use of a needle or other methods.

Secondly, a caesarean section, because of the innervation of the peritoneum, to a large extent, by the Great Splanchnic Nerve with a root level of T5-9 needs a block to approximately T5 and even in the most stoical patients there will be evidence of discomfort if the block is much below this level. Therefore, I must conclude that the technique used by the author produced a block to this level and that therefore could under no circumstances be considered a low spinal.

However my main criticism is in the author's belief in the apparent novelty of his dosage of 1.5 mls of either hyperbaric or '*plain*' Bupivacaine. My personal experience in the UK of over 2000 Caesarean Sections under spinal anaesthesia was that a dosage of 1.6 mls of isobaric (hypobaric) bupivacaine was consistently adequate[1]. These patients were mainly of UK origin and therefore probably taller and heavier, on the average,

than those in Dr Wilkinson's series. However, in Rwanda in 1995 and in Burundi in 1996 working mainly with Hutu patients who are, on the whole, smaller, my normal dosage has always been 1.5 mls of hyperbaric Lignocaine and I have seen total spinals with dosages in the region of 1.8 mls. I certainly would not consider giving a larger dose than 1.5 mls and would not expect a low block, in the commonly used definition of the term, with this dosage. It could be said that comparing Lignocaine with Bupivacaine is not valid but my experience would tend to suggest that in the case of LSCS one can do so. I may add that I have had similar experiences with Cambodian and Afghan patients.

I conclusion, I do not believe that Dr Wilkinson has been using a '*low spinal*' technique, but merely a well tried procedure with a block to the correct level for the procedure in question.

Yours faithfully
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References

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Dear Sir,

I read the responses to my description of low spinal anaesthesia for caesarean section with interest, especially as Dr's Longmate and Hair both gained initial experience with this technique as colleagues of mine at Hlabisa hospital. Their letter suggests that the anaesthesia provided by a low spinal is inadequate at times, but that it is safe. They suggest using a higher dose but recognise the potential risks and advocate use of ephedrine more frequently, to control any hypotension. I see no real conflict in opinion here. My own preference however, is for a safe and simple anaesthetic that works for almost all people almost all the time. Their concerns are based on personal observation and not on systematically collected data and as such should be considered with caution, until they are able to publish prospective observations to back them up. Most medical officers in this hospital now use 1.8 - 2ml heavy 0.5% bupivacaine in the (untested) belief that it provides a better anaesthetic - it also seems clear, discussing this with them, that the incidence of hypotension is now higher. I find it difficult to reconcile this potential increase in risk without any documented increase in benefit.

I can advise Dr Dennison that the block achieved by 1.5ml heavy bupivacaine in our patients is consistently around the T10 dermatome, so it seems that this does produce a low spinal in our patients. I did not suggest that the technique is novel. I think that he is probably correct that it would be unwise to compare lignocaine directly with bupivacaine. I would however, disagree that a block to T5 is necessary for a caesarean section. I was taught to do this operation by a nurse in a rural hospital in Africa using local anaesthetic only. In several hundred patients, gentle surgery and local anaesthetic was more than adequate.

I think that we would all agree that anaesthesia for caesarean section in district hospitals in developing countries needs to be safe, simple and effective. Whatever technique is used, we should all regularly - and prospectively - audit our work so we can document how safe and how effective it is.

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