Post-spinal hypotension in parturients undergoing lower segment Caesarean section: ‘preoperative anxiety’ or ‘anti-hyperbaricity’

Editor—I read with interest the study by Orbach-Zinger and colleagues that claimed a link between preoperative anxiety and post-spinal hypotension in term-parturients undergoing lower segment Caesarean section. The article seemed to overly credit correlative association of a subjective phenomenon (patient anxiety) with post-spinal systolic arterial pressure, which, peculiarly, was not backed by its objective counterpart (salivary amylase). They probably missed the actual scientific basis involving ‘cause (spinal anaesthesia) – effect (hypotension)’ temporality in that either the spinal anaesthesia was conducted as the manuscript detailed or they undertook certain precautions that were not mentioned.

It is known that the addition of fentanyl to the hyperbaric bupivacaine results in relative negation of hyperbaricity and higher/undesirable cephalic spread of the local anaesthetic. In practice, for the queer reason that befalls scientific contention, the ‘anti-hyperbaricity’ resulting from ambitious attempts at decreasing bupivacaine dose while fentanyl remaining the same has escaped contentious deliberation. Further, the practice of active aspiration of unsure/variable volume of cerebrospinal fluid at body temperature to confirm the spinal needle position adds to the ‘anti-hyperbaric’ effect. Since the study did not reflect intent to specifically entertain and address the possibility of ‘anti-hyperbaric’ nature of the co-solution leading to post-spinal hypotension, despite careful fluid loading (pre-/co-loading) and spinal anaesthesia administration in the sitting position, many study participants experienced post-spinal hypotension. Additionally, the immediate position change (sitting–supine) following the spinal block may have also complemented the ‘anti-hyperbaric’ effect.

The evidence that a defined preset spinal anaesthesia technique resulted in uniform achievement of block adequacy (T-4 level, bilaterally) in the majority of participants despite patient characteristic variability (body height, spine lengths), paradoxically, supports anti-hyperbaricity phenomenon and the related post-spinal hypotension. I am not sure as to whether or not the patients, after they got to the supine position, were made to fold their legs for related procedures (urinary catheterization, vaginal examination to assess cervical dilatation status/fetal-head descent) such that the cephalic movement of the co-solution was in excess of what the inadvertent ‘anti-hyperbaricity’ effect may have induced.

Therefore, it is difficult to assign the effect (post-spinal hypotension) solely to preoperative anxiety in the parturients. The absence of correlation of the salivary amylase, an indirect yet objective parameter of anxiety, with the post-spinal hypotension suggests that within the scope of the methods described in the study, the post-spinal hypotension may have been a random event induced by ‘anti-hyperbaricity’ rather than ‘preoperative patient anxiety’.

In conclusion, the correlation of ‘anxiety’, a fairly common element in term-parturients, with post-spinal hypotension may still have credible impact on obstetric spinal anaesthesia practice, provided they are backed by unbiased results of scientifically supple controlled investigations.

Declaration of interest

None declared.

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Reply from the authors

Editor—We thank Dr Dutta for his interest in our study.

We reported an observational study that showed that patients with higher levels of anxiety (assessed by VAS anxiety scores and STAI-s scores as subjective quantification measures) had more pronounced hypotension after spinal anaesthesia for Caesarean delivery.

Anxiety is by its very nature a subjective phenomenon. While salivary amylase is indeed an objective measurement, it must be remembered that it is at its best only a very indirect measure of anxiety. On the other hand, VAS anxiety scores and STAI-s scores are direct and validated quantifications of anxiety, subjectivity notwithstanding. In our study, as in other reports, salivary amylase had a lot of variability and was only poorly correlated with these direct, ‘subjective’ measures of anxiety.

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We are unsure of the basis of Dr Dutta’s contention that we ‘overly credit correlative association of...anxiety...with post-spinal systolic arterial pressure’ or that we ‘probably missed the actual scientific basis’ for cause and effect. As this was only an observational study, we actually do not claim to provide causative data, but merely report the association.

Spinal anaesthesia was conducted exactly as described in Methods. We agree that patient positioning has an effect on hypotension after spinal anaesthesia. All patients had urinary catheterization after spinal anaesthesia (anxious and non-anxious alike), so this is unlikely to have had any impact on the association of anxiety with spinal hypotension. No patients had vaginal examinations to assess cervical dilatation status/fetal-head descent after spinal anaesthesia, as these patients were all undergoing elective Caesarean delivery.

Dr Dutta argues that spinal hypotension may have been a random event induced by ‘anti-hyperbaricity’ rather than ‘pre-operative patient anxiety’. The ‘anti-hyperbaricity effect of fentanyl’ is indeed not mentioned much in the literature; we could not find a single reference in Medline or Google corresponding to that word in any spelling—neither in relation to spinal fentanyl nor in relation to cerebrospinal fluid aspiration. However, as all patients underwent the same anaesthesia protocol, we fail to see how this addresses the observed association of anxiety with spinal-induced hypotension.

We hope that these comments will be helpful.

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Peroperative factors which could influence anxiety levels
Editor—The article by Orbach-Zinger and colleagues on the influence of preoperative anxiety on hypotension after spinal anaesthesia is very interesting. Patients who are very anxious before their Caesarean do seem to have a greater incidence of hypotension and their consumption of intraoperative fluids and vasopressors also seems to be more. In our institute, we run phenylephrine infusion for all our patients at the start of their spinal anaesthesia and in spite of preloading all the patients with 1000 ml of Ringer’s lactate, we still find that the incidence of hypotension is still more in patients who exhibit greater preoperative anxiety.

I was, however, very keen to know whether during this study, did the authors look into any per- or intraoperative factors that could have influenced the degree of hypotension in these patients? The anxiety levels are influenced depending on whether the spinal was sited by an experienced anaesthetist. The need to do multiple attempts to establish a spinal block can influence the anxiety levels in patients in the three groups (low, medium, or high anxiety group). Patients who have been very calm and controlled before elective Caesarean section can get very anxious when there has been a struggle to establish an adequate spinal anaesthetic block. Also factors like intraoperative blood loss can also influence the haemodynamic stability and could have been an additional confounding factor precipitating further hypotension. I would be indeed very grateful if the authors could let me know whether they looked into these factors and was there any difference in the three groups with regard to the number of attempts to establish the spinal, its effect on anxiety, and consequently into the risk of these patients having hypotension?

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None declared.

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Reply from the authors
Editor—Thank you, Dr Khirwadkar, for your interest in our study.

First, we should state that the anxiety level was measured before the placement of the spinal so it would not have been affected by the number of spinal attempts or the difficulty in placement of the spinal anaesthesia.

However, to answer your question, we did record both the number of attempts and the time required to place a spinal. In the low, medium, and high anxiety groups (based on VAS anxiety as in our manuscript), the mean (so) time for spinal anaesthesia was 5.6 (3.7), 5.3 (3.8), and 6.3 (4.8) min, respectively. Furthermore, the number of attempts for the anxiety groups was as follows: low anxiety: 1 attempt (12), 2 attempts (5), 3 attempts (4); medium anxiety: 1 attempt (27), 2 attempts (3), 3 attempts (3); high anxiety: 1 attempt (18), 2 attempts (5), 3 attempts (6); one patient in this group had six attempts. There was no association between anxiety groups and either the number of attempts or the time taken for spinal. Furthermore, there was also no association between these indices of difficulty of the spinal and our