

Perfusion Index and Hypotension During Spinal Anaesthesia for Caesarian Section

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INTRODUCTION

- Hypotension is common with spinal anaesthesia (SA)
- Caused by sympathetic block.¹
- Intermittent non-invasive blood pressure measurement (NIBPM) is standard
- may fail to detect episodes of hypotension in a timely fashion compared to a continuous NIBPM device.²
- Previous work suggests a perfusion index (PI) of >3.5 predicts likelihood of hypotension during SA.³
- No studies to guide early management of hypotension.

GOAL: Observational study to establish if PI (and pleth variability index (PVI*)) could help prevent significant hypotension.

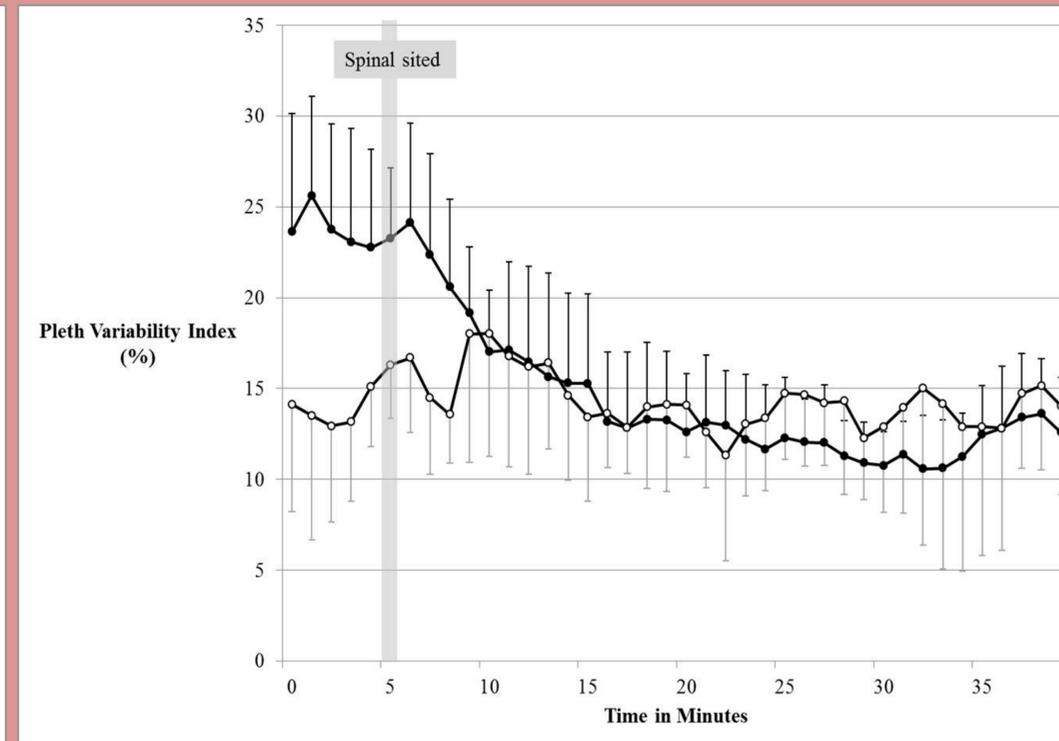
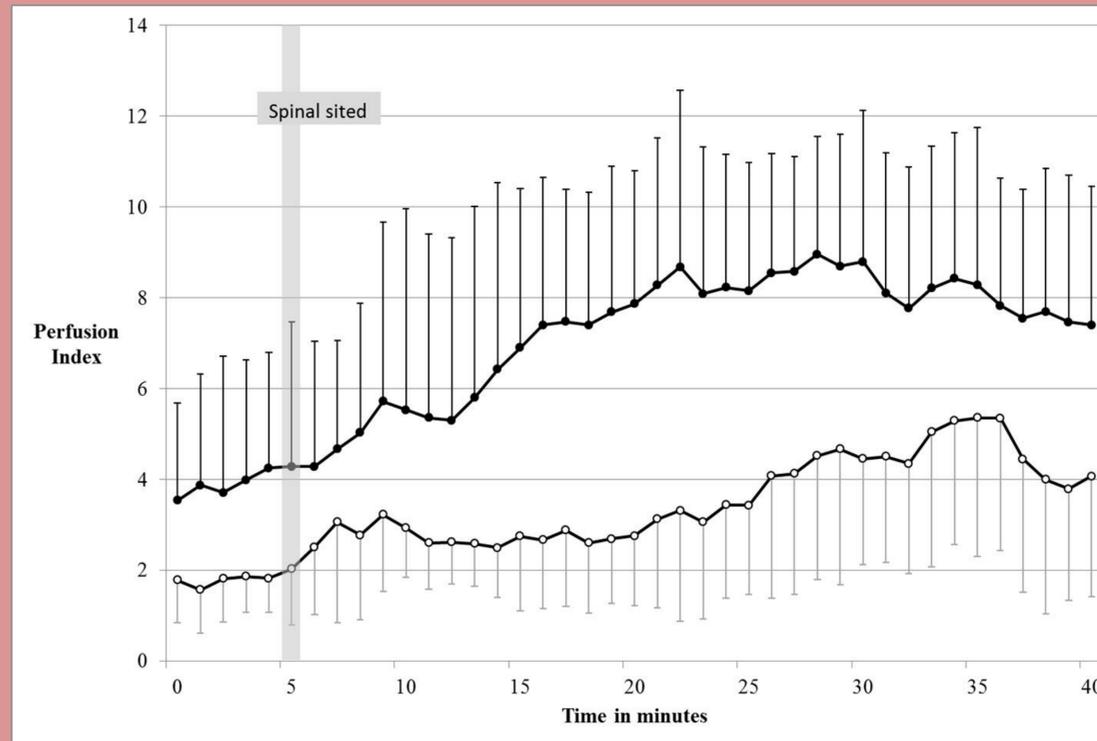
*variability of PI with respiratory cycle

METHOD

- 19 patients for elective LSCS.
- Radical Seven® pulse oximeter (measures PI and PVI) and finometer (continuous NIBPM) attached prior to SA.

RESULTS

- Following initiation of SA, PI values rose in 15 cases (and PVI fell in 13 cases).
- On average PI values rose more rapidly for the ten patients who experienced hypotension (fall in systolic BP >25%)
- Eight patients (no value for one) who did not become hypotensive had initial PI readings of <3.5
- Only three out of the ten who did become hypotensive had initial PI values of <3.5 (sensitivity 70%, specificity 100%)



Change in PI (left) and PVI (right), (mean, plus or minus one standard deviation) during spinal anaesthesia for cases with (●) or without (○) 25% fall in systolic blood pressure.

DISCUSSION

- Timing and degree of change in PI and PVI varied widely between patients.
- It did not demonstrate potential to inform management of blood pressure.
- High PI pre-SA may predict the occurrence of hypotension.
- PI appeared to increase higher and more quickly in women with significant hypotension
- suggests SA may have developed more quickly in these cases.

DISCUSSION CONTINUED...

- Continuous NIBPM with a finometer was well tolerated, but not suitable for routine use.
- Thoracic sympathetic blockade is known to increase PI in the fingers⁴
- Brachial plexus block has been shown to increase PI in blocked arm.⁵
- During SA the level of sympathetic block is several segments higher than the sensory block.⁶
- In our patients (median block height T3 to cold) the raised PI post SA is likely due to vasodilatation from sympathetic blockade of the hand.

References

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Summary

- Hypotension after spinal anaesthetic is common and due to sympathetic blockade
- Standard non-invasive blood pressure measurement is intermittent and may fail to identify the onset of hypotension
- Both the finometer and Radical Seven® oximeter were well tolerated in our patients, giving continuous readings
- While the pulse oximeter is easy and practical to use, the finometer is not
- Perfusion index could be useful to predict which patients may become hypotensive, but not to inform early management