

Is Lumbosacral Plexus Block an Effective and Safe Alternative as Surgical Anesthesia for Total Hip Replacement?

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Introduction

An increasing number of patients for hip replacement have severe cardiovascular comorbidity.¹

Spinal and general anesthesia are potentially dangerous for these patients due to risk of hemodynamic instability.²

Lumbosacral plexus block is reported to provide surgical anesthesia for total hip replacement.³

Hemodynamic impact from lumbosacral plexus block is theoretically minimal.

Hypothesis

Surgical anesthesia with Lumbosacral plexus block induces Less hemodynamic impact than Continuous spinal anesthesia and Single-dose spinal anesthesia

Subjects and Method

Unblinded and unrandomized pilot study.

6 patients for total hip replacement. Age \geq 50 years and ASA I-III.

Hemodynamic parameters measured by femoral artery pulse countour analysis from baseline to 60 min after block performance included:

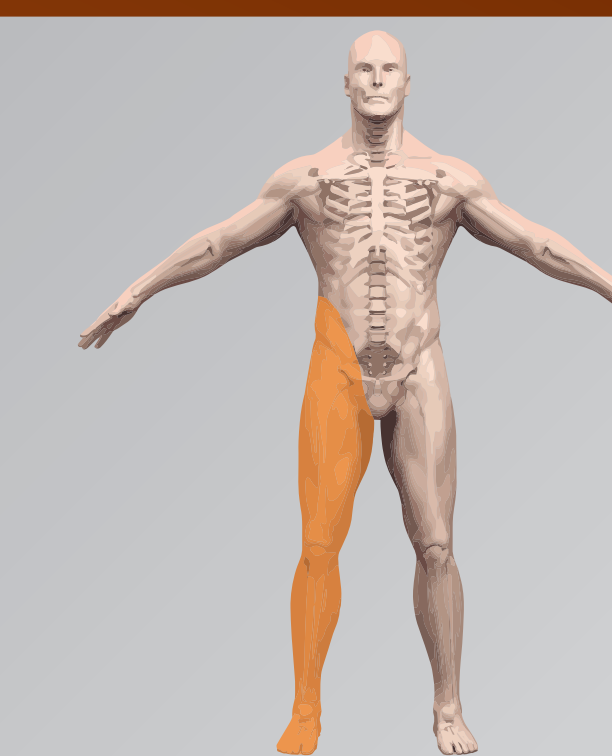
- Cardiac output (primary endpoint)
- Systemic vascular resistance
- Stroke volume
- Central venous oxygen saturation

Surgical Anesthesia

...with either...

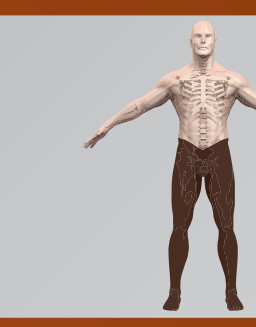
Lumbosacral Plexus Block (LSPB; n = 3)

- Blockade of Lumbar Plexus**
Shamrock block⁴ with 20 mL ropivacaine 7,5 mg/mL
- Blockade of Sacral Plexus**
ParaSacral Parallel Shift block⁵ with 10 mL ropivacaine 7,5 mg/mL
- Blockade of Iliohypogastric Nerve**
Transversalis fascia plane block⁶ with 10 mL ropivacaine 7,5 mg/mL



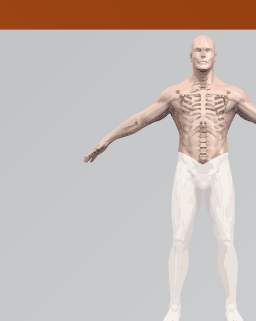
Continuous Spinal Anesthesia (CSA; n = 2)

Bupivacain 5 mg/mL titrated to effect - max 3 mL



Single-Dose Spinal Anesthesia (SDSA; n = 1)

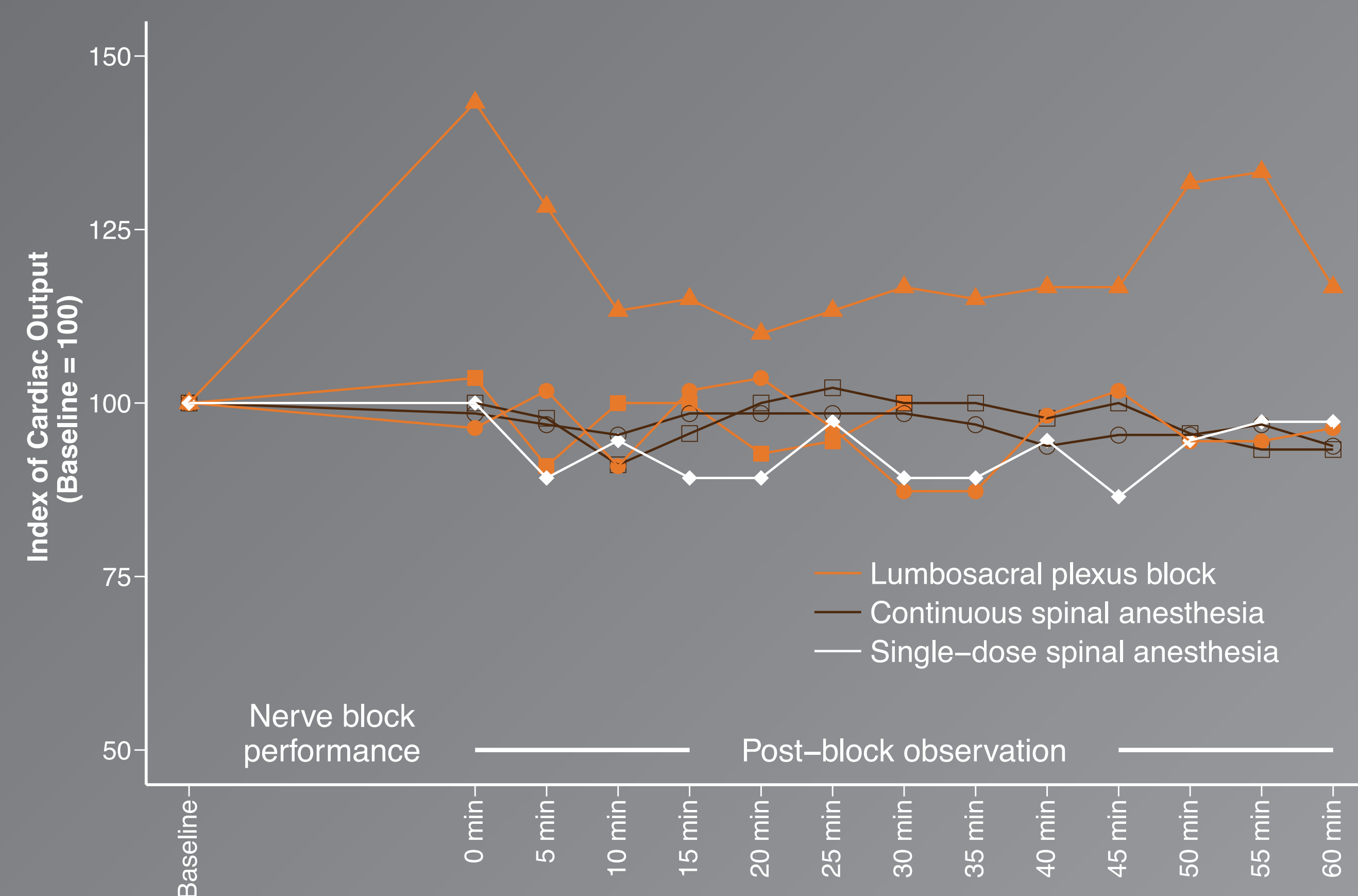
2 mL bupivacain 5 mg/mL as bolus dose



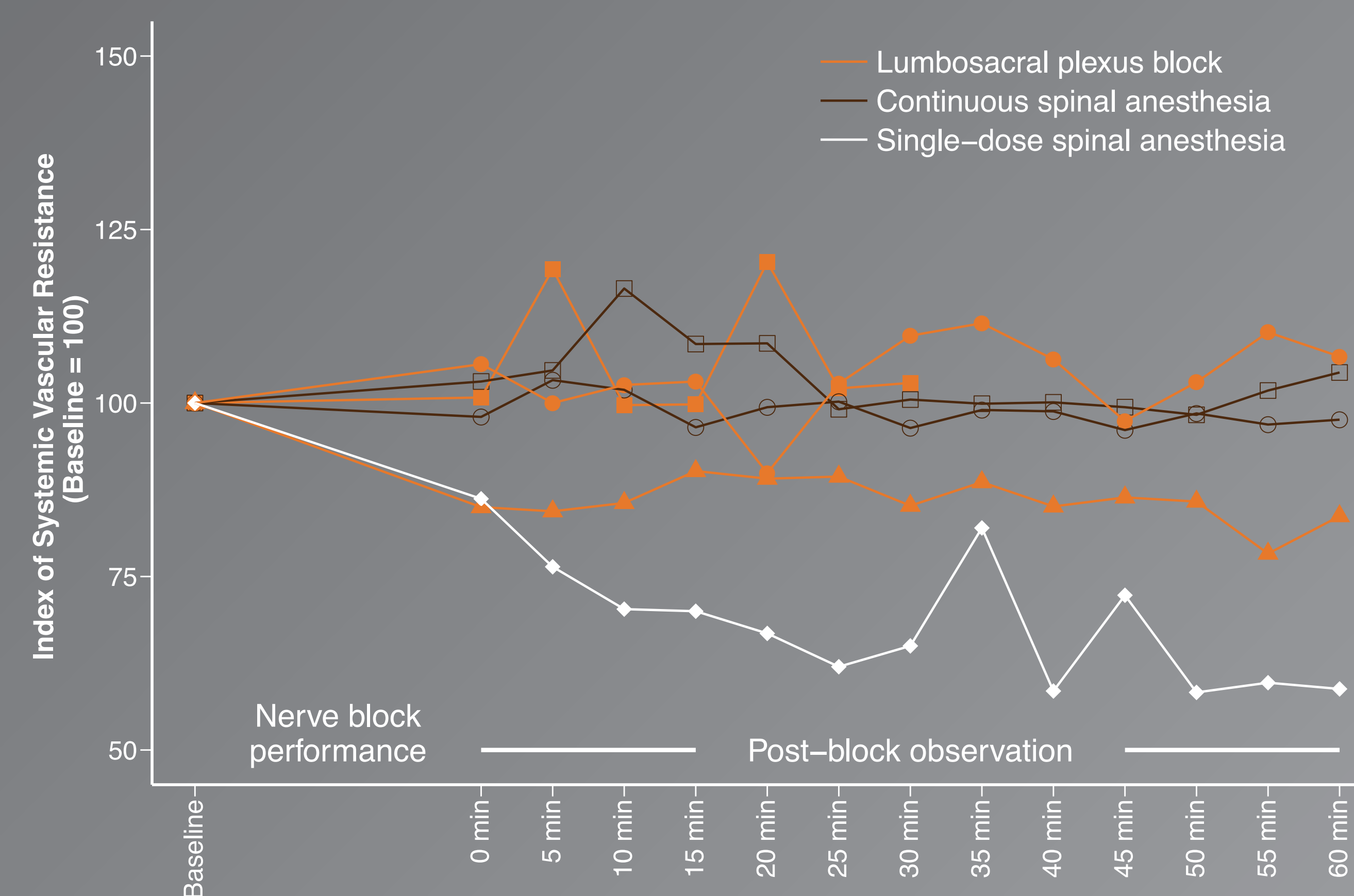
Observation

Subject resting for 1 hour.

Cardiac Output



Systemic Vascular Resistance



Further Results

No significant change in any hemodynamic parameters from baseline to 30 minutes after block performance in groups LSPB and CSA.

No significant difference detected between the treatments LSPB and CSA.

Insufficient anesthesia of posterior part of incision-area (innervated by superior cluneal nerves) in all 3 subjects with LSPB.

Conclusion

Neither lumbosacral plexus block nor continuous spinal anesthesia appear to affect any hemodynamic parameters in this pilot study on patients without severe cardiovascular comorbidity.

Lumbosacral plexus block did not provide complete surgical anesthesia for total hip replacement. Additional block of superior cluneal nerves would have been needed.

Further studies are necessary to access the hemodynamic effects of lumbosacral plexus block in patients with cardiovascular comorbidity. Performing such studies in patients without severe cardiovascular disease is probably futile.

References

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