

Regional haemodynamic variables and perfusion index in the evaluation of sciatic nerve block: a prospective observational trial

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Objective: We determined whether regional haemodynamics and perfusion index (PI) could be reliable indicators of a successful sciatic nerve block (SNB).

Design: Prospective observational trial.

Setting: A tertiary teaching hospital in China from April 2020 to August 2020.

Participants: We assessed 79 patients for eligibility to participate in this study. Nine patients were excluded for not meeting our inclusion criteria, and three patients were excluded due to missing measurements at all time points.

Interventions: The patients underwent SNB. Pulsed-wave Doppler and PI measurements were performed.

Primary and secondary outcome measures: The primary outcome measure was the diagnostic power of regional haemodynamic change and PI to predict successful SNB. The secondary outcome measure was the effect of SNB on the regional haemodynamics and PI in the lower extremity.

Results: We assessed 79 patients in this study and 67 patients available for the final analysis. The SNB was successful in 59 patients and failed in eight patients. There were no significant differences in demographic characteristics between the patients with successful and failed SNB. Starting from 10 min after SNB, the peak systolic velocity (PSV), end-diastolic velocity, time-averaged maximum velocity and time-averaged mean velocity of the anterior tibial artery and posterior tibial artery of patients in the successful SNB group were significantly higher than those in the failed SNB group ($p < 0.05$). The PSV percentage increase at 10 min after SNB has great potential to predict the block success. The area under the receiver operating characteristic curve (AUC) values were 0.893 (95% CI 0.7809 to 1.000) and 0.880 (95% CI 0.7901 to 0.9699). The corresponding cut-off values were 19.22 and 35.88, respectively. The PI increased during 5–45 min intervals in patients with successful SNB. The AUC for the PI percentage increases at 10 min after SNB was 0.853 (95% CI 0.7035 to 1.000), with a cut-off value of 93.09.

Conclusion: The regional haemodynamic variables, PSV and PI in particular, can be used as alternative indicators for clinicians to evaluate the success of SNB objectively and early.