

INPLASY PROTOCOL

To cite: Liu et al. Perfusion index use as an early predictor of brachial plexus block effectiveness: A Systematic Review and Meta-Analysis Study. Inplasy protocol 202330107. doi: 10.37766/inplasy2023.3.0107

Received: 26 March 2023

Published: 26 March 2023

Corresponding author:
Yin Xia

xiayin2201@outlook.com

Author Affiliation:
Anhui Provincial Children's Hospital.

Support: Scientific research project of Anhui Provincial Children's Hospital (21etty005).

Review Stage at time of this submission: Preliminary searches.

Conflicts of interest:
None declared.

INTRODUCTION

Review question / Objective: To evaluate whether the perfusion index (PI) can be used to predict and provide a cut-off value for brachial plexus block success.

Perfusion index use as an early predictor of brachial plexus block effectiveness: A Systematic Review and Meta-Analysis Study

Liu, JX¹; Liu, L²; Ye, HW³; Sun, YY⁴; Xia, Y⁵.

Review question / Objective: To evaluate whether the perfusion index (PI) can be used to predict and provide a cut-off value for brachial plexus block success.

Condition being studied: The success of peripheral nerve blocks is usually assessed by sensory and motor function. But this method is subjective, time-consuming, and cannot be done in patients under general anesthesia (GA), deep sedation, or otherwise unable to provide feedback. Perfusion index (PI) is a simple, objective, and non-invasive method for evaluating the success of peripheral nerve blocks. Understanding the value of Perfusion index in the brachial plexus block is more beneficial to perioperative management.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 26 March 2023 and was last updated on 26 March 2023 (registration number INPLASY202330107).

Condition being studied: The success of peripheral nerve blocks is usually assessed by sensory and motor function. But this method is subjective, time-consuming, and cannot be done in patients under general anesthesia (GA), deep sedation, or otherwise unable to provide feedback. Perfusion index (PI) is a simple, objective,

and non-invasive method for evaluating the success of peripheral nerve blocks. Understanding the value of Perfusion index in the brachial plexus block is more beneficial to perioperative management.

METHODS

Participant or population: The subjects were adult patients who received brachial plexus block.

Intervention: Perfusion index values in the arm with brachial plexus block.

Comparator: Perfusion index values in the arm without brachial plexus block.

Study designs to be included: Randomized controlled trials and prospective observational study.

Eligibility criteria: Only trials that clinical value of Perfusion index in predicting brachial plexus block effectiveness will be included.

Information sources: PubMed, Embase, Web of Science, Clinical Trials, Medline, CNKI, Cochrane Library, and Cochrane Central Register of Controlled Trials.

Main outcome(s): 1、PI and PI ratio; 2、The predictive value of ROC curve analysis of Perfusion index.

Quality assessment / Risk of bias analysis: Two reviewers will independently assess the risk of bias based on the following domains from recommendations from the Cochrane handbook: 1. Adequate sequence generation; 2. Allocation concealment; 3. Blinding; 4. Incomplete outcome data and how it was addressed; 5. Selective reporting of the outcome; 6. Any other biases. results of bias assessment will be presented in a figure and a graph indicating low, high, or unclear risk of bias for each of the 6 items in each trial. Sensitivity analysis will be conducted based on the bias assessment to assess the robustness of the results.

Strategy of data synthesis: The STATA software version 15.0 or Revman5.3 were used for all statistical analyses. Study heterogeneity was measured using the Q test and I^2 test. Fixed-effects models (Mantel-Haenszel, $P > 0.05$ and $I^2 < 50\%$) assume that the differences between the results of various studies are due to chance. Random-effects models (M-H heterogeneity, $P > 50\%$) assume that the results can genuinely differ between studies. When heterogeneity is present, the random-effects model is considered more appropriate than a fixed-effects model, resulting in wider intervals and a more conservative estimate of effect.

Subgroup analysis: If the included studies have high heterogeneity a subgroup analysis will be performed. The subgroup analysis will be performed according to age.

Sensitivity analysis: Using Stata 15.0 and Review Manager 5.3 software, the sensitivity analysis was carried out after the low-quality research was eliminated. If the combined sensitivity and specificity ratio did not change significantly in general, the results showed good stability and reliability.

Country(ies) involved: China.

Keywords: Brachial plexus block, perfusion index, peripheral nerve block, ultrasound.

Contributions of each author:

Author 1 - Junxia Liu.
Email: liujunx89@126.com
Author 2 - Lei Liu.
Author 3 - Hongwu Ye.
Author 4 - Yingying Sun.
Author 5 - Yin Xin.