

Usefulness of the perfusion index for monitoring the response to intravenous ketamine infusion therapy in patients with complex regional pain syndrome

Hong SW, Hwang MS, Kim JH, Kim M, Kim SH. *Pain Pract.* 2023 Jun;23(5):535-542. doi: 10.1111/papr.13215.

Background: This study was performed to compare the perfusion index (PI) between affected and unaffected limbs in patients with complex regional pain syndrome (CRPS); it also evaluated the usefulness of the PI for monitoring the response to intravenous ketamine infusion therapy in such patients.

Methods: In total, 46 patients with CRPS in one arm or leg were enrolled in this study. The PIs of the unaffected (PI_{Control}) and affected (PI_{CRPS}) limbs were simultaneously evaluated before and after treatment.

Results: PI_{CRPS} was significantly lower than PI_{Control} at all time points. The change in PI from immediately before to 30 min after intravenous ketamine infusion therapy (T_{Before} and $T_{30 \text{ min}}$, respectively) in the affected limb was significantly correlated with the change in visual analog pain scale (VAS) between the two time points ($r = 0.646$, $p < 0.001$). The area under the curve for the changes in VAS and PI_{CRPS} between T_{Before} and $T_{30 \text{ min}}$ was 0.928. The optimal threshold value for the change in PI_{CRPS} between T_{Before} and $T_{30 \text{ min}}$, to distinguish responders with a ≥ 50 -point reduction in VAS score from nonresponders, was 22.60% with a sensitivity of 0.811 (95% CI: 0.774-0.848) and a specificity of 0.889 (95% CI: 0.848-0.930). Thirty-one patients showed a ≥ 50 -point reduction in VAS score [67% (95% CI: 54%-80%)] and 15 patients showed a < 50 -point reduction in VAS score [33% (95% CI: 20%-46%)]. Thirty patients showed an increased $PI \geq 22.60\%$ [65% (95% CI: 50%-78%)] and 16 patients showed an increased $PI < 22.60\%$ [35% (95% CI: 22%-50%)]. Twenty-seven patients had a ≥ 50 -point reduction in VAS score and an increased $PI \geq 22.60\%$ [59% (95% CI: 44%-74%)]. Eleven patients had shown a < 50 -point pain reduction in VAS score and increased $PI < 22.60\%$ [24% (95% CI: 13%-37%)].

Conclusion: The PI significantly differed between affected and unaffected limbs in patients with CRPS. The PI may be useful for monitoring the response to intravenous ketamine therapy in patients with CRPS.