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


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\textsubscript{Control}) and affected (PI\textsubscript{CRPS}) limbs were simultaneously evaluated before and after treatment.

Results: PI\textsubscript{CRPS} was significantly lower than PI\textsubscript{Control} at all time points. The change in PI from immediately before to 30 min after intravenous ketamine infusion therapy (T\textsubscript{Before} and T\textsubscript{30 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\textsubscript{CRPS} between T\textsubscript{Before} and T\textsubscript{30 min} was 0.928. The optimal threshold value for the change in PI\textsubscript{CRPS} between T\textsubscript{Before} and T\textsubscript{30 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 ≥ 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 ≥ 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.