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Ankle-brachial index to monitor limb perfusion in patients with femoral venoarterial extracorporeal membrane oxygenation

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Abstract

Background: Limb ischemia is a major complication of femoral venoarterial extracorporeal membrane oxygenation (VA-ECMO). Use of ankle-brachial index (ABI) to monitor limb perfusion in VA-ECMO has not been described. We report our experience monitoring femoral VA-ECMO patients with serial ABI and the relationships between ABI and near infrared spectroscopy (NIRS). Methods: This is a retrospective single-center review of consecutive adult patients placed on femoral VA-ECMO between January 2019 and October 2019. Data were collected on patients with paired ABI and NIRS values. Relationships between NIRS and ABI of the cannulated (E-NIRS and E-ABI) and non-cannulated legs (N-NIRS and N-ABI) along with the difference between legs (D-NIRS and D-ABI) were determined using Pearson correlation. Results: Overall, 22 patients (mean age 56.5±14.0 years, 72.7% male) were assessed with 295 E-ABI and E-NIRS measurements, and 273 N-ABI and N-NIRS measurements. Mean duration of ECMO support was 129.8±78.3 hours. ECMO-mortality was 13.6% and in-hospital mortality was 45.5%. N-ABI and N-NIRS were significantly higher than their ECMO counterparts (ABI mean difference 0.16, 95%CI 0.13-0.19, p<0.0001; NIRS mean difference 2.51, 95%CI 1.48-3.54, p<0.0001). There was no correlation between E-ABI vs. E-NIRS (r=0.032, p=0.59), N-ABI vs. N-NIRS (r=0.097, p=0.11), or D-NIRS vs. D-ABI (r=0.11, p=0.069). Conclusions: ABI is a quantitative metric that may be used to monitor limb perfusion and supplement clinical exams to identify limb ischemia in femorally cannulated VA-ECMO patients. More studies are needed to characterize the significance of ABI in femoral VA-ECMO and its value in identifying limb ischemia in this patient population.

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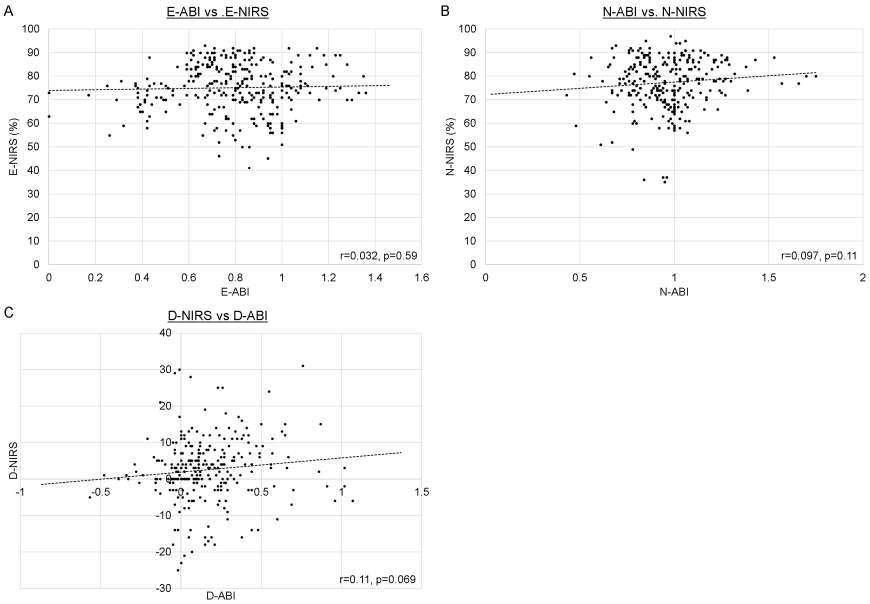

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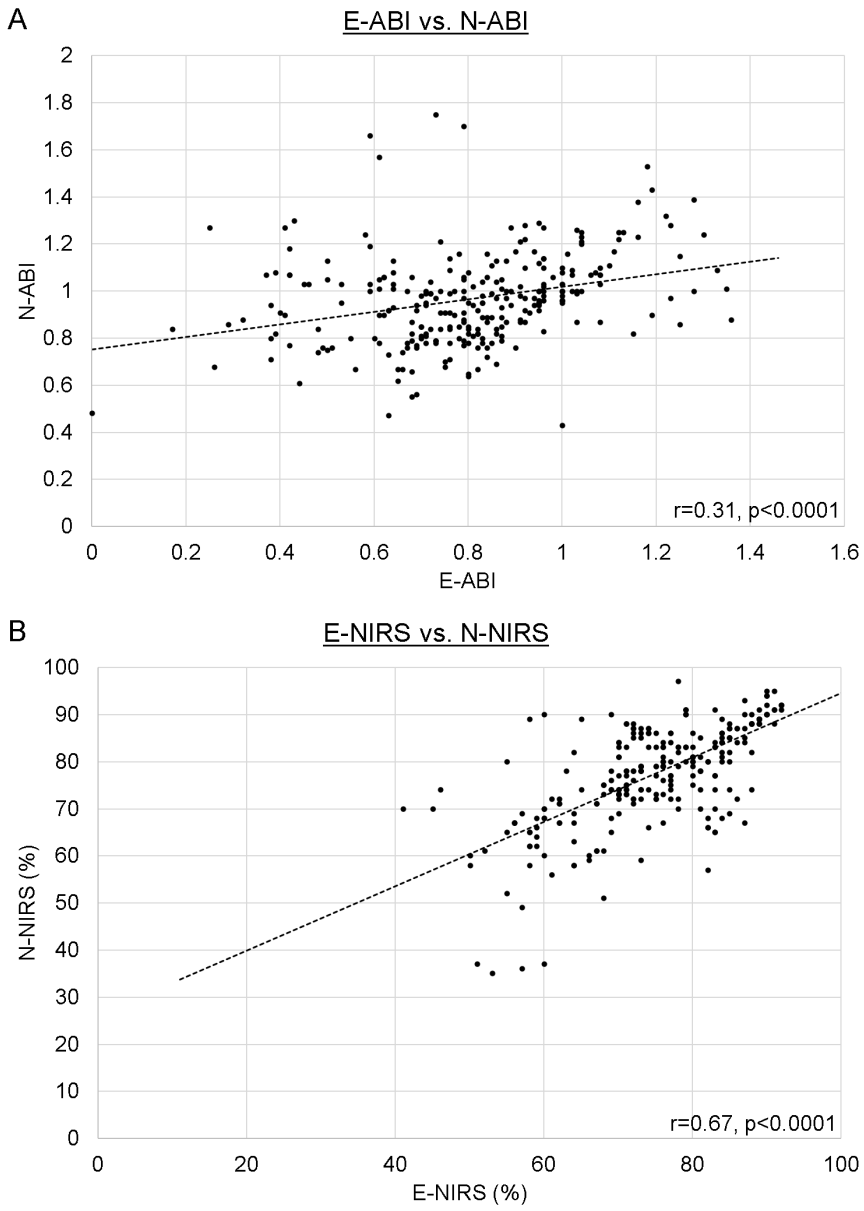

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