

A Multimodal Approach for Prognostication of Post-Anoxic Brain Injury

A multimodal approach, including NPI and BS on EEG, SSEPs and NSE, has a higher predictive value for UO than recommended predictive tools.

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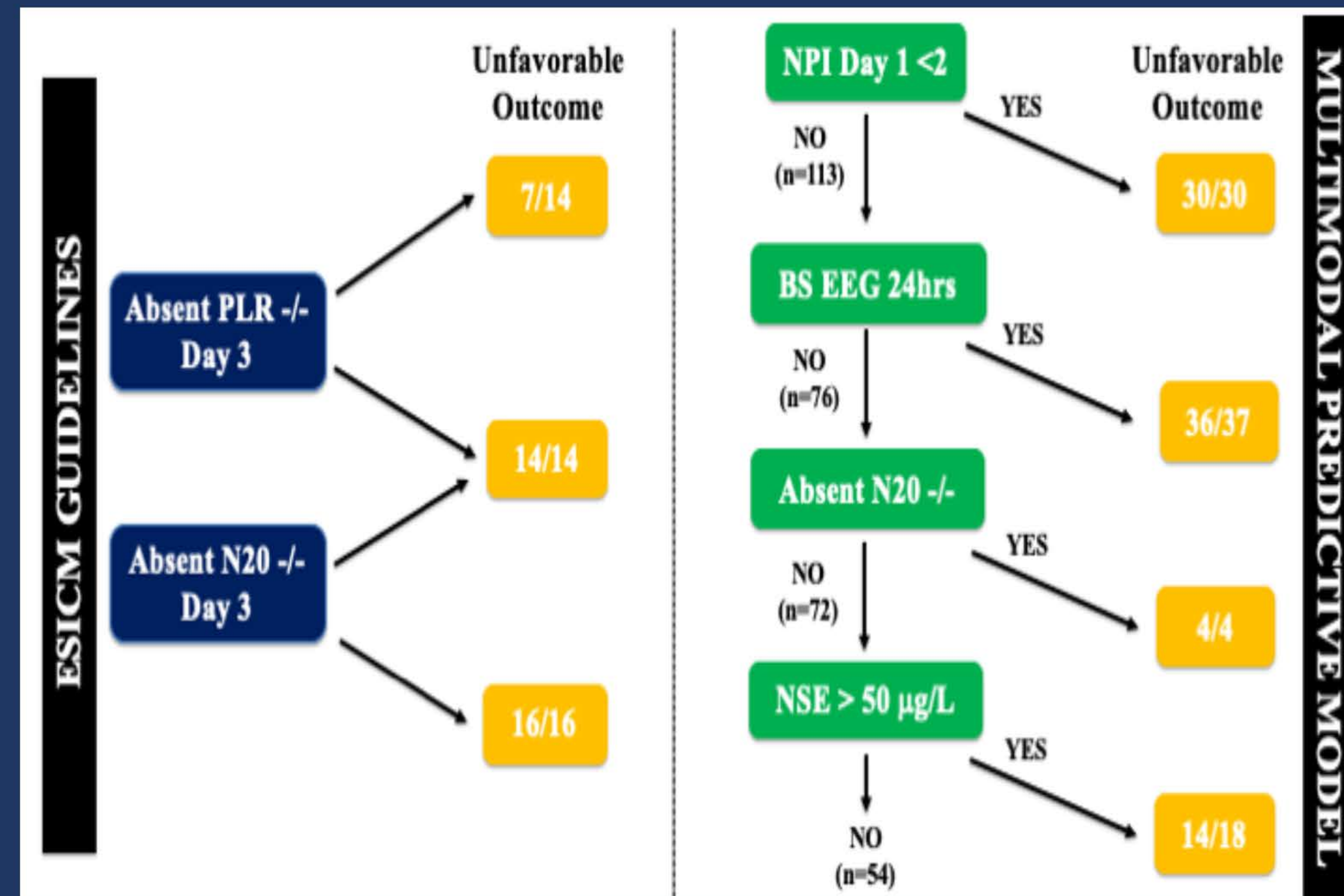
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Introduction: International Guideline recommend using bilaterally absence of pupillary light reflex (PLR) and/or bilaterally absence of the cortical response (N20) to short-latency somatosensory evoked potentials (SSEPs) at 72 hours after return to spontaneous circulation to predict unfavorable outcome in comatose patients after cardiac arrest. The aim of this study was to compare this algorithm with a multimodal approach including other prognostic tools.

Methods: Retrospective study of adult (>18 years) cardiac arrest patients admitted from January 2016 to March 2019 and who underwent multimodal monitoring. We collected demographic characteristics and cardiac arrest data, together with SSEPs, the presence of burst-suppression on early EEG, a neurological pupillary index on the automated pupillometry <2 at 24 after arrest and a neuron-specific enolase (NSE) exceeding 50 mg/L. We defined 3-month unfavorable neurological outcome (UO) with Cerebral Performance Category ≥3.

Results: We included 143 patients; 104 (73%) of those had UO. Using the approach of Guidelines, unfavorable outcome at day 3 was observed in 7/14 patients with absent PLR, in 16/16 with absent N20 and 14/14 with combined absent pupillary light reflex and N20; 51/104 (49%) patients with UO were identified. Using the multimodal approach, UO was identified in 30/30 patients with NPI <2 and 36/37 patients with BS on EEG. Among the others, UO was associated with absent N20 in 4/4 patients and with high NSE values in 14/18 patients. This approach identified 84/104 (81%) patients with unfavorable outcome. The Area Under Curve to predict UO for the approach of Guidelines was 0.66, which increased to 0.80 with the multimodal approach.



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