EVALUATING NEURACI: ACCURACY OF A NEUROREHABILITATION COMPLEXITY AND RESOURCE ALLOCATION INDEX

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Background and Aims

Efficient resource allocation at hospital admission is essential in neurological rehabilitation due to the clinical heterogeneity of patients, which complicates expenditure assessment. This study aimed to evaluate the accuracy of NeuRACI (Neurorehabilitation Resource Allocation and Complexity Index) in categorizing patients by clinical complexity and to compare its performance with individual clinical variables.

Methods

We included 243 patients referred to neurological rehabilitation. NeuRACI is a composite index that allocates resources by combining four clinical factors: clinical complexity, acute length of stay (LOS), age, and presence of an artificial airway. Each factor is assigned an adjustable weight. Patients were classified into two groups based on the absence (Group A) or presence (Group B) of an artificial airway. ROC curve analysis was used to assess the accuracy of NeuRACI and other clinical variables in distinguishing between these groups.

Results

The mean NeuRACI score for Group A was 943.19, while Group B had a significantly higher mean score of 5251.41, reflecting greater resource allocation priority for more complex patients with artificial airways or prolonged LOS ($t = -23.427$; $p < .001$). Group B also exhibited multiple comorbidities indicative of a more complex clinical state compared to Group A ($t = -14.103$; $p < .001$). No significant differences were found between groups in age or acute LOS. NeuRACI demonstrated excellent discriminative ability with an AUC of 0.98 (95% CI: 0.96–0.99; $p < .001$).

Conclusion

NeuRACI effectively integrates multiple clinical factors to categorize patients by complexity and airway status in neurorehabilitation setting. This index facilitates objective decision-making and supports tailored care planning aligned with individual patient needs.

Keywords: rehabilitation, needs, care, patients, resources