Assessment of malnutrition with bioimpedance analysis (BIA) and its prognostic impact in patients with ischemic stroke

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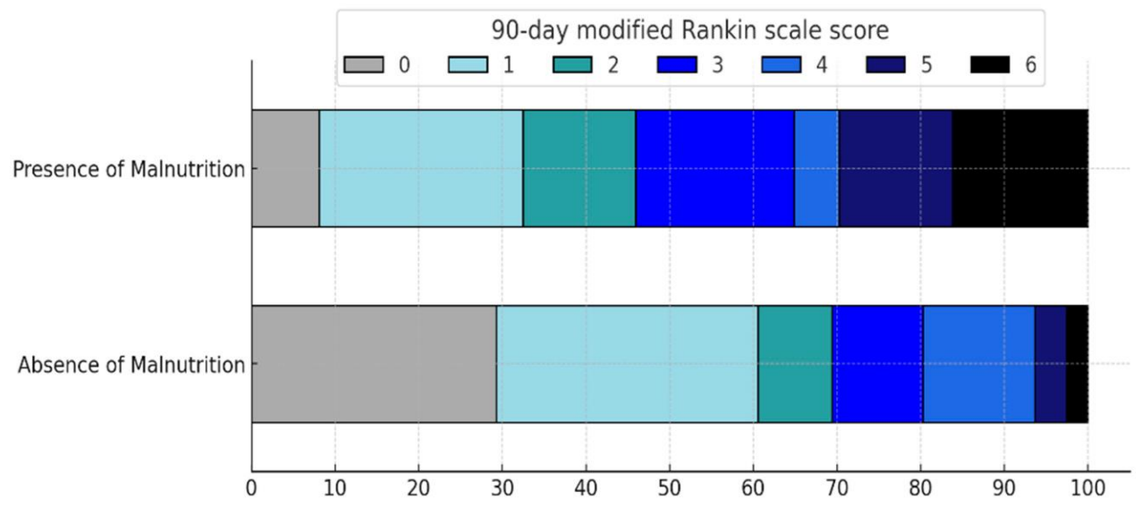
Background and Aims

The relationship between malnutrition and poor outcomes in stroke patients is well-established.

Nutritional status assessment has traditionally relied on composite lab-based scores. Bioimpedance analysis (BIA) and bioelectrical impedance vector analysis (BIVA) offer non-invasive, cost-effective, and rapid evaluations of body composition, nutritional, and hydration status. This study aimed to compare the ordinal distribution of mRS scores 90 days after ischemic stroke between malnourished and non-malnourished patients according to BIVA parameters.

Methods

We conducted a single-center prospective observational study on patients admitted for ischemic stroke between April 1 and September 30, 2024. Using inverse probability weighting (IPW) and ordinal logistic regression, we analyzed the association between malnutrition and mRS outcomes.



Weighted ordinal logistic regression according to the mRS scale at 90 days post-ischemic cerebrovascular event (Legend: mRS = modified Rankin Scale; NIHSS = National Institutes of Health Stroke Scale; IVT = intravenous thrombolysis; LDL = low-density lipoprotein).

		mRS Shift (Univariate)	
Predictors	*Common Odds Ratio*	*CI*	*p*
Presence of malnutrition	3.34	1.74–6.41	**0.001**
		mRS Shift (Multivariate)	
Predictors	*Adjusted Common Odds Ratio*	*CI*	*p*
Presence of malnutrition	2.79	1.37–5.70	**0.005**
Female sex	0.85	0.48–1.51	0.580
NIHSS at admission (per unitary increase)	1.19	1.11–1.28	**<0.001**
IVT	0.28	0.15–0.52	**<0.001**
Mechanical thrombectomy	0.41	0.14–1.18	0.097
Lymphocytes (per unitary increase)	1.01	1.00–1.02	**0.027**
Albumin (per unitary increase)	0.82	0.75–0.89	**<0.001**
Total cholesterol (per unitary increase)	0.99	0.97–1.02	0.875
LDL (per unitary increase)	1.01	0.98–1.03	0.742

Results

Among 195 patients, 37 (19%) were malnourished upon Stroke Unit admission based on BIVA parameters. Malnutrition was associated with higher mRS scores at 90 days (cOR 3.34, 95% CI1.74–6.41; p=0.001). Adjusted analyses confirmed malnutrition as an independent predictor of unfavorable outcomes (acOR 2.79, 95% CI 1.37–5.70; p=0.005). Other significant predictors included NIHSS score (acOR 1.19, 95% CI 1.11–1.28; p<0.001), intravenous thrombolysis (acOR 0.28, 95% CI 0.15–0.52; p<0.001), lymphocyte count (acOR 1.01, 95% CI 1.00–1.02; p=0.027), and albumin concentration (acOR 0.82, 95% CI 0.75–0.89; p<0.001).

Conclusion

BIVA-identified malnutrition is a significant predictor of poor post-stroke outcomes. Implementing BIVA in clinical practice may enhance early risk stratification and guide tailored nutritional interventions to improve recovery trajectories.

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Young Investigator Award Application: No

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