Utilizing the Modified Frailty Index-5 to Predict Outcomes in Patients with Large Hemisphere Infarction Syndrome

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Introduction

- Frailty is a multifactorial syndrome that leads to loss of physiologic reserve which may contribute to poor outcomes in critically ill patients
- We hypothesized that the severity of pre-morbid frailty would contribute to poor outcome in patients admitted to the Neuro ICU with Large Hemispheric Infarct (LHI) Syndrome

Methods

- LHI was defined as an anterior circulation stroke with a NIHSS score ≥ 15
- Severity of Frailty was defined by the modified Frailty Index – 5 (mFI-5).
- The 5 factors in the mFI-5 include a history of HTN, COPD, DM, CHF and non-independent functional status.
- Spearman's correlation and student's T-test were used to identify continuous or categorical variables associated with mFI-5
- The mFI-5 was dichotomized at the mean to represent low and high frailty index
- Multivariate logistic regression analyses were performed to determine if high frailty index was independently associated with poor outcome at 3 months (defined as mRS ≥ 4) as well as poor outcome among survivors (defined as mRS 4-5).

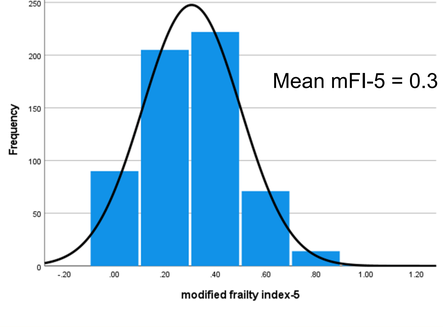
Results

Table 1. Admission Characteristics

Characteristic	mean (SD) or n (%)
Age, *years*	66 (15)
Female	290 (48%)
Past Medical History	
Congestive Heart Failure	103 (17%)
Hypertension	480 (79%)
COPD	61 (10%)
Diabetes Mellitus	223 (37%)
Premorbid Non-independent Functional Status	67 (10%)
NIHSS score	21 (4)
ASPECT score	8 (3)
tPA administration	253 (42%)
Mechanical Thrombectomy	369 (61%)
Reperfusion [1]	310 (84%)
Glucose (mg/dL)	145 (63)

1Thrombolysis in Cerebral Infarction scale score >2

Figure 1: Distribution of mFI-5 scores



Key Message:
High pre-morbid frailty, defined as a modified Frailty Index-5 score of >0.3, is an independent predictor of 3-month recovery in patients with LHI

Table 2. Predictors of Poor Recovery[1] at 3 months

Predictor	OR	95% CI	P value
High mFI-5[2]	1.81	1.17– 2.80	0.008
Age, *years*	1.06	1.04 – 1.07	< 0.001
NIHSS score	1.13	1.07 – 1.20	< 0.001
ASPECT score	0.82	0.74 – 0.92	< 0.001
Clinical or Radiographic Herniation	4.98	2.31 – 10.73	< 0.001
Hospital Acquired Infection	2.76	1.70 – 4.49	< 0.001

[1]Poor recovery defined as modified Rankin Scale Score ≥4.
[2]Defined as a mFI-5 score> 0.3

Table 3. Predictors of Poor Recovery in Survivors[1] at 3 months

Predictor	OR	95% CI	P value
High mFI-5[2]	1.95	1.21 - 3.13	0.006
Age, *years*	1.04	1.02 - 1.06	< 0.001
NIHSS score	1.09	1.02 - 1.16	0.006
ASPECT score	0.76	0.68 - 0.85	< 0.001
Clinical or Radiographic Herniation	3.94	1.71 - 9.06	0.001
Hospital Acquired Infection	2.51	1.47 - 4.27	0.001

[1]Poor recovery in survivors defined as modified Rankin Scale Score 4-5. [2]Defined as a mFI-5 score >0.3

Figure 2: Mean mFI-5 for Patients Requiring a Tracheostomy and No Tracheostomy

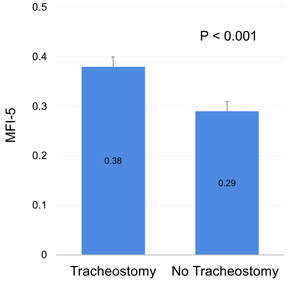


Figure 3: Mean mFI-5 for Patients Requiring a PEG and no PEG

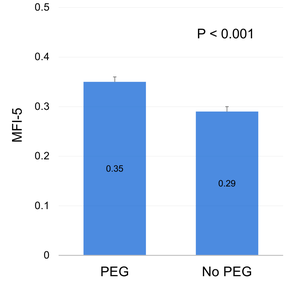


Table 4. Association Between mFI-5 and In-hospital Complications

In-hospital Complications	n (%)	Mean mFI-5 (SD)	P value
Tracheostomy			< 0.001
Yes	76 (12.6)	0.38 (0.19)	
No	526 (87.2)	0.29 (0.19)	
PEG[1]			
Yes	176 (29.2)	0.35 (0.19)	< 0.001
No	427 (70.8)	0.29 (0.19)	

[1]PEG, Percutaneous Endoscopic Gastrostomy Tube.

Conclusion

- Assessment of the mFI-5 on admission was found to be an independent predictor of poor outcome in patients with LHI.
- Higher mFI-5 informs the need for tracheostomy and PEG tube.
- Future studies will assess the utility of the mFI-5 in broader stroke populations.