



Agreement Between Fried Frailty Phenotype And Cumulative Deficits Frailty Indices: A Prospective Multi-Center Study

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INTRODUCTION

- Frailty is gaining increased recognition in the evaluation of lung transplant (LTx) candidates. The Fried Frailty Phenotype (FFP) index has been the most commonly used instrument and is associated with pre- and post-transplant morbidity and mortality.^{1,2}
- An alternative approach to assessing frailty is the Cumulative Deficits Frailty Index (CFI), which evaluates health deficits across multiple domains that may aid in refining candidacy evaluation.^{3,4}
- The relationship between these two frailty indices has not been evaluated in LTx candidates and may provide a greater understanding of the construct measured by these two indices.

STUDY AIMS

- Evaluate the distribution of FFP and CFI scores among LTx candidates.
- Assess agreement between the FFP and the CFI.

Hypothesis

We hypothesized that frailty using the FFP will be more prevalent than using the CFI in LTx candidates and there will be moderate agreement between the two indices.

METHODS

Study Design:

- Prospective, multi-center study of a subset of participants in the Clinical Trials in Organ Transplantation-20 cohort who completed both the FFP and CFI assessments pre-transplant (Duke, Toronto, and John Hopkins), **Figure 1**.
- FFP was characterized using 5 criteria (unintentional weight loss, grip strength, energy levels, gait speed and physical activity), with FFP frailty defined: (≥ 3 criteria frail; 1-2 pre-frail (1-2) and 0 not frail with pre-frail/not frail combined).
- The CFI was comprised of 40 health items abstracted from medical records with frailty defined as $> 10/40$ (score of > 0.25) deficits (**Table 1**).

Statistical Analysis

- Agreement between total FFP and CFI scores was assessed using Cohen's Kappa statistic and we also evaluated the distribution of CFI scores based on the FFP score.

RESULTS

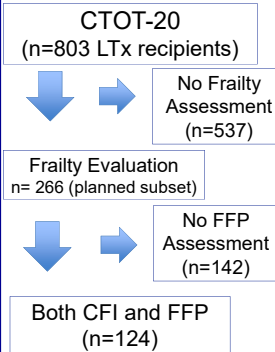


Figure 1: Participant Flow Diagram

Table 1: Variables in Cumulative Deficits Frailty Index

Clinical	- Cardiovascular, Peripheral, & Cerebrovascular Disease - Hypertension, Hyperlipidemia & Diabetes; - Sleep Disorder Breathing; - Hepatobiliary, Gastrointestinal & Genitourinary Disease; - Hematological, Malignancy History - Neurological Disease, Mental Health, & Chronic Pain - Osteoporosis; Musculoskeletal & Rheumatologic Disease
Diagnostic Tests	- ECG Rate and Rhythm; Estimated GFR - Hemoglobin; White Blood Cell Count; Platelets; - Sodium; Potassium; Calcium; Glucose; - Albumin and Alkaline Phosphatase - Hepatitis B Antigen; CMV IgG
Lifestyle Factors	- History of Smoking, Alcohol and Recreational Drug Use - Employment/Schooling; - Support Person; Adherence History & Finances - Relocation Needs; Distance from LTx Center; - English Interpreter

Table 2. Baseline Characteristics and Frailty Prevalence

Parameters	Total (n=124)
Age, Median (Q1, Q3), years	63 (50, 68)
Male Sex	69 (56 %)
Body Mass Index (kg/m ²)	24.4 \pm 3.8
Restrictive Lung Disease	71 (57%)
Chronic Obstructive Lung Disease	29 (23%)
Cystic Fibrosis	20 (16%)
Pulmonary Vascular Disease	4 (3%)
Duke University	68 (55%)
Toronto General Hospital	41 (33%)
John Hopkins Hospital	15 (12%)
Lung Allocation Score, Median (Q1,Q3)	39 (34, 46)
Fried Index	
Frail	11 (9 %)
Pre-Frail	85 (69 %)
Not Frail	28 (23%)
Cumulative Frailty Index, Median (Q1,Q3)	0.23 (0.16, 0.28)
Frail (≥ 0.25)	48 (39%)

Table 3. Agreement between Frailty Indices

	Frail by CFI	Not Frail by FFP
Frail by FFP	7 (6%)	4 (3%)
Not Frail by FFP	41 (33%)	72 (58%)

Kappa = 0.11 95% CI (-0.02 to 0.24)

RESULTS

Figure 2. Bubble plot of FFP and CFI scores

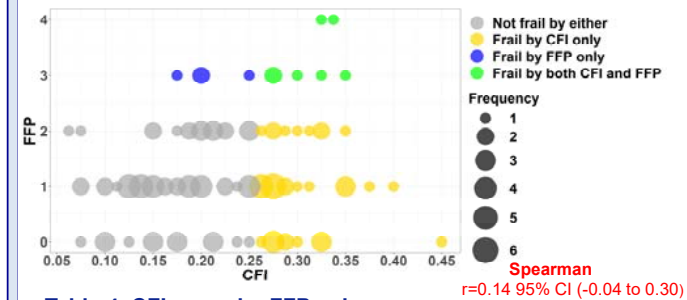


Table 4. CFI score by FFP subscore

FFP Subscore	Median CFI Score (Q1,Q3)
Low Gait Speed	
Positive criteria	0.25 (0.19, 0.33)
Negative criteria	0.21 (0.15, 0.28)
Low Grip Strength	
Positive criteria	0.23 (0.18, 0.32)
Negative criteria	0.23 (0.15, 0.28)
Exhaustion	
Positive criteria	0.23 (0.18, 0.28)
Negative criteria	0.24 (0.15, 0.28)
Weight Loss	
Positive criteria	0.26 (0.20, 0.29)
Negative criteria	0.21 (0.15, 0.28)
Low Physical Activity	
Positive criteria	0.25 (0.21, 0.28)
Negative criteria	0.21 (0.15, 0.28)

SUMMARY & CONCLUSIONS

- Frail by CFI (39%) was more commonly observed than FFP (9%)
- Agreement between frailty indices was poor, suggesting the CFI captures a different construct than FFP.
- CFI was more concordant with physical domains of weight loss, physical inactivity, and gait speed than grip strength or reported exhaustion.
- The study is ongoing evaluating the prognostic utility of these indices with early post-transplant outcomes.

REFERENCES

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