Sarcopenia Is Associated With Frailty In Lung Transplant Candidates

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BACKGROUND

The number of lung transplant candidates age ≥ 65 years undergoing transplantation is rising dramatically.

Concurrent to this shift, post-transplant morbidity and resource utilization have also increased.

In this context, lung transplant centers are struggling to identify which older patients will fare well following transplantation.

Frailty, a state of low physiologic reserve, is associated with increased morbidity and mortality after lung transplantation.

Sarcopenia, the presence of low muscle mass, is considered a cardinal component of frailty; this relationship has not previously been assessed in lung disease.

OBJECTIVES

1. To measure the prevalence of sarcopenia in lung transplant candidates by three separate definitions.
2. To evaluate the relationship between sarcopenia and frailty in advanced lung disease.

METHODS

In a multicenter prospective cohort of 367 lung transplant candidates, 3 sarcopenia definitions were tested:

1. European Working Group on Sarcopenia in Older People 2 (EWGSOP2)
2. Foundation for the National Institutes of Health (FNIH) Sarcopenia Project
3. Lowest quartile of gender-specific appendicular skeletal muscle (ASM) mass

Table. Gender-Specific Cut-Points to Diagnose Sarcopenia

	Muscle Mass (men)
EWGSOP2	ASM/ht^2 < 7.0 kg/m^2
FNIH	ASM_{BMI} < 0.8
Lowest Quartile	ASM/ht^2 < 7.4 kg/m^2

	Muscle Mass (women)
EWGSOP2	ASM/ht^2 < 5.5 kg/m^2
FNIH	ASM_{BMI} < 0.512
Lowest Quartile	ASM/ht^2 < 5.8 kg/m^2

Frailty measures included:

1. Short Physical Performance Battery (SPPB; range 0-12; SPPB ≤7 = frail)
2. Fried Frailty Phenotype (FFP; range 0-5; FFP ≥3 = frail)

Associations between sarcopenia definitions and frailty were tested by logistic regression, adjusting for age, sex, and diagnosis.

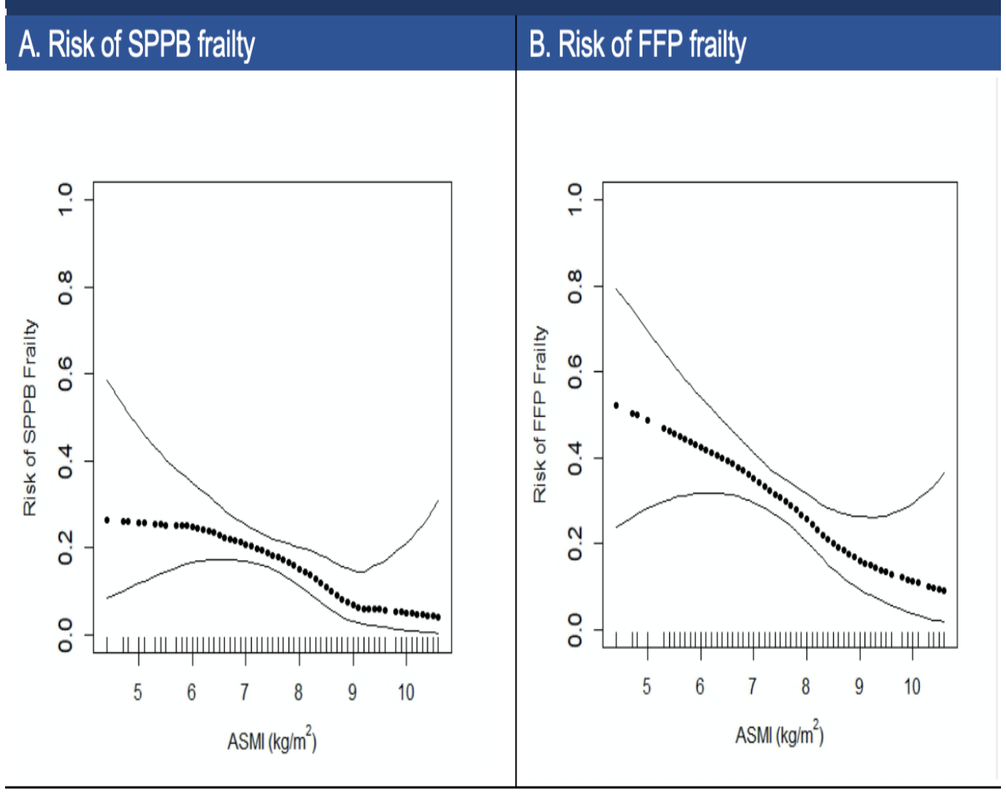
Generalized additive models (GAMs) tested non-linear associations between appendicular skeletal mass (ASM) mass index (ASMI = ASM/ht^2) and frailty.

RESULTS

Table. Sarcopenia and risk of frailty, testing three definitions of sarcopenia

	EWGSOP2	FNIH	Lowest Quartile of ASM Mass Index
SPPB Odds Ratio (95% CI)	3.4 (1.7-7.0)	0.9 (0.4-2.2)	1.8 (0.9-3.2)
p value	<0.01	0.86	0.08
FFP Odds Ratio (95% CI)	2.4 (1.2-5.0)	1.3 (0.6-2.9)	2.3 (1.3-4.1)
p value	0.02	0.51	<0.01

Figure. Associations between appendicular skeletal muscle mass index (ASMI) and predicted risk of frailty using (A) SPPB and (B) FFP.



GAM = Generalized Additive Model. Dark dotted black line represents the effect estimates. Surrounding thin lines represent 95% confidence bands. Each vertical line in the rug plot along the x-axis represents a single study subject. Models are adjusted for age and sex. ASMI = ASM/ht^2. SPPB = Short Physical Performance Battery. FFP = Fried Frailty Phenotype.

CONCLUSIONS

Sarcopenia is associated with frailty in lung transplant candidates by EWGSOP2 and lowest quartile definitions.

Future studies should optimize sarcopenia definitions and determine if reducing sarcopenia improves lung transplant outcomes.

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