Characteristics Associated with SF-36 in Alpha-1 Antitrypsin Deficiency-Related Lung Disease: a Cross-Sectional Analysis

Radmila Choate[1], Kristen E. Holm[2, 3], Robert A. Sandhaus[2, 3], David M. Mannino[4], Charlie Strange[3,5]

[1] University of Kentucky College of Public Health, Lexington, Kentucky; [2] Department of Medicine, National Jewish Health, Denver, Colorado; [3] AlphaNet, Inc., Coral Gables, Florida;
[4] University of Kentucky College of Medicine, Lexington, Kentucky; [5] Division of Pulmonary, Critical Care, Allergy and Sleep Medicine, Medical University of South Carolina, Charleston, South Carolina

Introduction

- Generic measures of health-related quality of life (HRQoL), such as the 36-Item Short Form Survey (SF-36), are widely used in assessing chronic conditions and allow comparisons across different health conditions and with the general population.
- In alpha-1 antitrypsin deficiency (AATD)-associated chronic obstructive pulmonary disease (COPD), HRQoL research remains scarce. This cross-sectional study evaluates the factors associated with HRQoL in a cohort of patients with AATD-associated COPD.

Methods

- This study included data collected via structured telephone interviews between 2008 and 2019 from 4,398 participants of AlphaNet, a not-for-profit health management organization for individuals with AATD in the United States who are prescribed augmentation therapy.
- Norm-based SF-36 scores for the mental and physical component summary scores (MCS and PCS, mean of 50 ± 10 in the general US population) and 8 individual subscales were evaluated.
- Generalized linear regression models were fit to examine the association between MCS and PCS scores and baseline age, sex, regular use of oxygen, exacerbation frequency, mMRC, and productive cough.

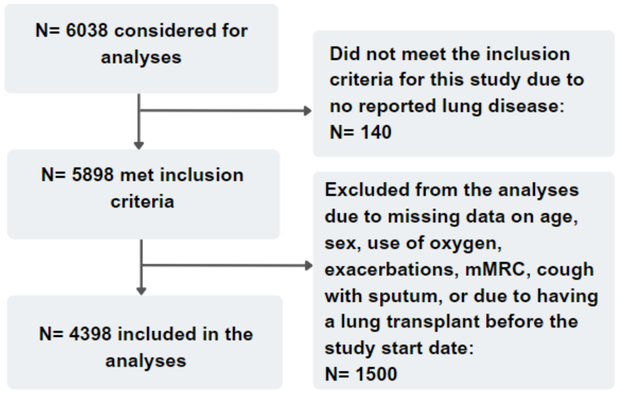

Figure 1. Study Flow Diagram

Results

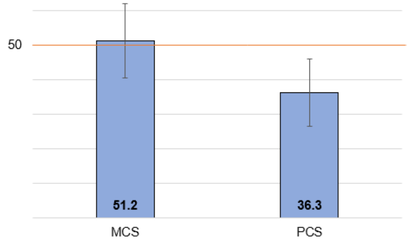

Figure 2. Baseline SF-36 mental and physical component summary score (MCS and PCS) means in the overall cohort, n=4398. Note: *SF-36 summary scores are norm-based, with an average of 50 (SD=10) for the general US population.*

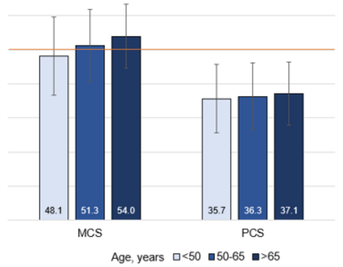

Figure 3. SF-36 component summary scores by age. p<0.0001 for comparison of mean MCS scores and p=0.0040 for comparison of mean PCS scores across age groups

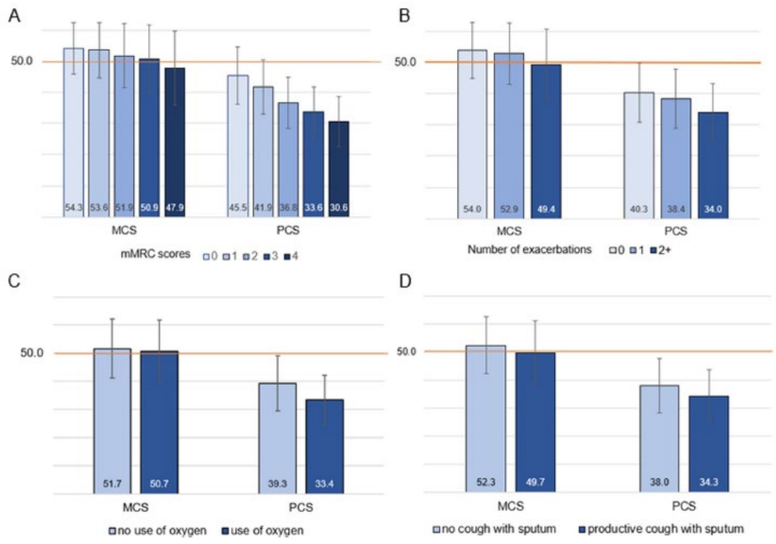

Figure 4. SF-36 summary scores by clinical characteristics- A) mMRC score, B) number of exacerbations at baseline, C) use of oxygen, and D) having productive cough with sputum. p<0.0001 for comparison of mean MCS and PCS scores by mMRC, frequency of exacerbations, and productive cough. p=0.0034 for comparison of mean MCS and p<.0001 for mean PCS scores by use of oxygen

Results (continued)

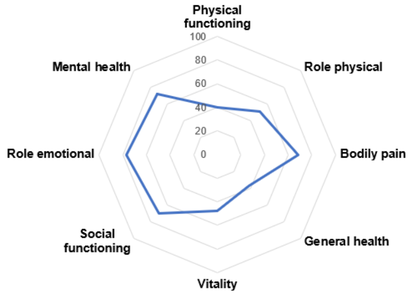

Figure 5. SF-36 subscale scores in the overall cohort, n=4398. Note: SF-36 subscale scores range from 0-100, with *higher scores indicating better health*

	n (%)	MCS			PCS		
		Adjusted coefficient	95% CI	p-value	Adjusted coefficient	95% CI	p-value
Age, years							
<50	1010 (23.0)	REF			REF		
50-65	2355 (53.6)	2.59	(1.82; 3.39)	<.0001	0.20	(-0.41; 0.81)	0.5228
>65	1033 (23.5)	4.74	(3.82; 5.67)	<.0001	0.43	(-0.31; 1.16)	0.2526
Sex							
Male	1996 (45.4)	REF			--		
Female	2402 (54.6)	0.79	(0.18; 1.41)	0.0117	--		
mMRC							
0	404 (9.2)	REF			REF		
1	986 (22.4)	-0.45	(-1.65; 0.76)	0.4662	-3.04	(-4.0; -2.09)	<.0001
2	826 (18.8)	-1.75	(-3.00; -0.50)	0.063	-7.25	(-8.25; -6.26)	<.0001
3	950 (21.6)	-2.40	(-3.66; -1.15)	0.0002	-9.73	(-10.72; -8.74)	<.0001
4	1232 (28.0)	-5.07	(-6.32; -3.82)	<.0001	-12.03	(-13.02; -11.04)	<.0001
Frequency of exacerbations in the past year							
0	1001 (22.8)	REF			REF		
1	915 (20.8)	-0.38	(-1.32; 0.56)	0.4265	-0.46	(-1.20; 0.28)	0.2233
2 or more	2482 (56.4)	-2.59	(-3.40; -1.78)	<.0001	-3.03	(-3.67; -2.38)	<.0001
Regular use of oxygen in the past year							
No	2193 (49.9)	REF			REF		
Yes	2205 (50.1)	0.30	(-0.38; 0.97)	0.3871	-2.62	(-3.15; -2.09)	<.0001
Daily productive cough for at least 3 months each year over the past 2 years							
No	2462 (56.0)	REF			REF		
Yes	1936 (44.0)	-1.21	(-1.85; -0.56)	0.0003	-1.37	(-1.88; -0.86)	<.0001

Table 1. Multivariable associations between demographic and clinical characteristics and MCS and PCS of SF-36. Adjusted R^2 for the MCS model is 0.09. Adjusted R^2 for the PCS model is 0.30.

Conclusions

- Patient-perceived physical health is significantly impaired in this cohort with AATD-associated lung disease, whereas mental health status is comparable to the general US population.
- Several disease-specific factors are associated with worse HRQoL and need to be taken into consideration to optimize the quality of life of people living with AATD.

References: Ware J, Sherbourne C. Med Care. 1992;30(6):473–83.
Choate, R., et al. BMC Pulmonary Medicine 24.1 (2024): 138.

Disclosures: This research was supported by an unrestricted grant from AlphaNet. RC reports research funding from AlphaNet. CS reports grants in Alpha-1 antitrypsin deficiency or COPD paid to the Medical University of South Carolina from Adverum, Arrowhead, AstraZeneca, CSA Medical, Grifols, Nuvaira, Takeda, and Vertex. He is a medical director at AlphaNet. CS has consulted for Bronchus, Dicerna, GlaxoSmithKline, Pulmanage, and Vertex for Alpha-1 and/or COPD.