

Association Between Sarcopenic Obesity and Pulmonary Function in Korean Elderly

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Background/Aims: Sarcopenia is defined the loss of muscle mass and strength with aging. Sarcopenic obesity (SO), a combination of sarcopenia and obesity has become a significant public health problem because patients with SO are more likely to show impaired performance and have various diseases than sarcopenia and obesity alone. Despite body composition is related to lung function, few studies have reported the effects of sarcopenic obesity on lung function. Thus, the aim of this study was to investigate the association between lung function and SO. **Methods:** We analysed national representative data of 2,258 adults aged ≥ 65 years from the Korean National Health and Nutrition Examination Survey 2014-2016. Hand grip strength (HGS) was measured in KNHANES survey from 2014 to 2016 to estimate muscle strength. Subjects were divided into four groups: non-sarcopenic non-obese (S- O-), non-sarcopenic obese (S- O+), sarcopenic non-obese (S+ O-), and sarcopenic obese (S+ O+) according to the presence or absence of sarcopenia (HGS lower than 28.6kg for men and 16.4kg for women) and obesity (body mass index (BMI) ≥ 25 mg/k2). We defined the restrictive spirometry pattern as an FVC $< 80\%$ of predicted value. **Results:** HGS was positively associated with forced volume vital capacity (FVC) in both men and women. Compared to the S- O- group, the S+ O+ group showed significantly lower FVC values. Men in the S+ O+ group showed greater odds for the risk of restrictive lung disease than those in the S- O- group (odds ratios [ORs]: 4.08, 95% confidence interval [CI]: 1.99-8.37) and the ORs for the restrictive lung disease in S+ O+ men were higher than those of S+ O- men. S+ O+ women showed 1.99-times higher risk of restrictive lung disease than S- O- women (95% CI: 0.98-4.03) indicating a trend, albeit not reaching statistical significance. There was no significant difference in FEV1/FVC ratio (a marker for obstructive lung disease) among groups regardless of sex. **Conclusions:** Having SO is associated with a higher risk for restrictive lung disease in Korean elderly men.

Table 1. Lung function index* by the status of sarcopenic obesity

	Sarcopenic obesity			
	S- O-	S- O+	S+ O-	S+ O+
Men				
FVC (L)	3.45 ^{b,c}	3.31 ^a	3.15 ^a	3.08
FVC (percent predicted)	83.9 ^{b,d}	78.0 ^a	80.2	73.8 ^a
FEV1 (L)	2.24 ^c	2.16 ^c	1.99 ^{ab}	2.02
FEV1 (percent predicted)	81.6	78.8	77.5	74.4
FEV1/FVC	0.66	0.66	0.64	0.66
Women				
FVC (L)	2.48 ^{c,d}	2.48 ^{c,d}	2.29 ^{ab}	2.30 ^{ab}
FVC (percent predicted)	81.5 ^{b,d}	78.7 ^a	78.7	75.7 ^a
FEV1 (L)	1.79 ^c	1.79 ^c	1.62 ^{ab}	1.68
FEV1 (percent predicted)	80.6	80.4	76.1	78.8
FEV1/FVC	0.72	0.72	0.71	0.73

* evaluated for subjects with age of 75 years, high education, heavy alcohol consumption, smoker, active physical activity, positive dyslipidemia, positive hypertension, and positive diabetes.

^a < 0.05 vs. S- O-; ^b < 0.05 vs. S- O+; ^c < 0.05 vs. S+ O-; ^d < 0.05 vs. S+ O+

FVC, forced volume vital capacity; FEV1, forced expiratory volume in 1 second

Table 2. Multiple Logistic Regression Analyses to Determine ORs for restrictive lung disease according to the status of sarcopenic obesity

	Men				Women		
	Sarcopenic obesity	OR (95% CI)	P value		Sarcopenic obesity	OR (95% CI)	P value
S- O-	1		<0.001	S- O-	1		0.10
S- O+	2.43	(1.64-3.59)		S- O+	1.47	(1.00-2.17)	
S+ O-	2.16	(1.32-3.54)		S+ O-	1.81	(0.82-3.99)	
S+ O+	4.08	(1.99-8.37)		S+ O+	1.99	(0.98-4.03)	

adjusted for age, education, alcohol consumption, smoking, physical activity, dyslipidemia, hypertension, and diabetes.