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A Correlation Study of Goutallier's grading and sarcopenia in rotator cuff tears patients

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Introduction and Background

Sarcopenia is an age-related syndrome characterized by progressive loss of skeletal muscle mass and strength, resulting in musculoskeletal fragility and functional decline. Degenerative rotator cuff tears are common in elderly and frequently demonstrate fatty infiltration, as classified by the Goutallier. Although sarcopenia and rotator cuff degeneration share overlapping risks, their association remains unclear. This study aimed to investigate the correlation between sarcopenia and rotator cuff muscle fatty infiltration in degenerative rotator cuff tear patients.

Material and Method

This single-center cross-sectional study included patients aged ≥55 years with degenerative rotator cuff tears confirmed by magnetic resonance imaging. Sarcopenia was diagnosed based on low handgrip strength measured using a Jamar dynamometer and reduced appendicular skeletal muscle mass assessed by bioelectrical impedance analysis. Rotator cuff muscle fatty infiltration was graded according to the Goutallier classification. Tendon retraction (Patte classification), muscle atrophy (Warner classification), and tear size were evaluated. Demographic variables and comorbidities were recorded. Multivariate logistic regression analysis was performed to identify factors independently associated with sarcopenia

Results

The study enrolled 168 patients. 44 patients(26.2%) demonstrated high-grade fatty infiltration (Goutallier grade 3–4). Patients with high-grade Goutallier were older and had higher body mass index, as well as prevalence of diabetes and hypertension ($p < 0.01$). Sarcopenia was identified in 22 patients (13.1%), and 77.3% of these exhibited Goutallier grade 3–4. After adjustment for age, BMI, diabetes, and hypertension, high-grade fatty infiltration remained independently associated with sarcopenia (adjusted odds ratio, 6.96; 95% confidence interval, 2.06–23.46; $p = 0.002$).

Conclusions

The severe fatty infiltration is strongly associated with sarcopenia in degenerative rotator cuff tear patients,. These findings suggest that advanced local rotator cuff degeneration reflects systemic muscle loss, highlighting the importance of sarcopenia assessment in elderly with high Goutallier grades.

Figure & Table 1.

Table-1 Demographic and Clinical Characteristics by Goutallier Grade

	Goutallier 1+2 (n= 124)	Goutallier 3+4 (n= 44)	p-value
Age	66.38±7.01	72.97±8.06	<0.001
Sex			
male	42(33.87)	16(36.36)	0.765
female	82(66.13)	28(63.64)	
BMI	25.53±4.33	27.64±3.88	0.004
Diabetes			
no	103(83.06)	23(52.27)	<0.001
yes	21(16.94)	21(47.73)	
Hypertension			
no	87(70.16)	20(45.45)	0.003
yes	37(29.84)	24(54.55)	

Figure & Table 2.

Table-2 Clinical Characteristics by Sarcopenia

	All (n=168)	No Sarcopenia(n=146)	Sarcopenia (n=22)	p-value
Goutallier_grade				
1+2	124(73.81)	119(81.51)	5(22.73)	<0.001
3	32(19.05)	24(16.44)	8(36.36)	
4	12(7.14)	3(2.05)	9(40.91)	
Patte grade				
1	118(70.24)	111(76.03)	7(31.82)	<0.001
2+3	50(29.76)	35(23.97)	15(68.18)	
Warner grade				
0	40(23.81)	38(26.03)	2(9.09)	<0.001
1	78(46.43)	76(52.05)	2(9.09)	
2+3	50(29.76)	32(21.92)	18(81.82)	
Size tear				
1	99(58.93)	96(65.75)	3(13.64)	<0.001
2	36(21.43)	31(21.23)	5(22.73)	
3+4	33(19.64)	19(13.01)	14(63.64)	