NUTRITIONAL DEFICIENCIES AND METABOLIC ALTERATIONS ASSOCIATED WITH SARCOPENIA IN RHEUMATOLOGIC PATIENTS

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Introduction: Secondary sarcopenia in rheumatologic disorders involves profound metabolic shifts and nutritional depletion. This study aimed to investigate the relationship between visceral protein spectrum metrics, lipid profiles, and muscle tissue wasting in rheumatic patients.

Methods: We analyzed 200 patients (65.0% female, 35.0% male) with systemic rheumatic diseases. Sarcopenia status was confirmed using the EWGSOP2 protocol (BIA, handgrip dynamometry, and a 4-meter walk test). The metabolic profile was evaluated comprehensively by measuring total protein, albumin, prealbumin, transferrin, total cholesterol, and body fat mass. Data processing was conducted via Student's t-test and Mann-Whitney U-test using SPSS v.26.

Results: Out of 200 patients, 62 (31.0%) had confirmed sarcopenia. The sarcopenic group exhibited severe nutritional depletion across all assessed visceral protein metrics compared to the non-sarcopenic cohort: total protein (63.2 ± 3.1 g/l vs. 70.1 ± 3.8 g/l, $p < 0.0001$), albumin (32.8 ± 3.2 g/l vs. 38.9 ± 2.9 g/l, $p < 0.0001$), prealbumin (29.1 ± 1.7 mg/dl vs. 34.2 ± 1.2 mg/dl, $p = 0.001$), and transferrin (1.61 ± 0.30 g/l vs. 2.11 ± 0.37 g/l, $p < 0.0001$). Total cholesterol was also significantly reduced in sarcopenic individuals (4.21 ± 1.54 mmol/l vs. 4.89 ± 1.24 mmol/l, $p < 0.002$). Concurrently, functional and structural metrics were severely impaired: appendicular muscle parameters were diminished (21.2 ± 4.4 vs. 29.8 ± 6.9, $p < 0.0001$) and gait speed was significantly slower (0.7 ± 0.2 m/s vs. 1.3 ± 0.2 m/s, $p < 0.0001$). Interestingly, despite lower skeletal metrics, body fat mass was significantly higher in the sarcopenic group (25.9 ± 5.9 kg vs. 21.2 ± 8.1 kg, $p = 0.001$), strongly confirming a "sarcopenic obesity" phenotype.

Table 2. Comparative Analysis of Clinical, Laboratory, and Metabolic Parameters Based on Sarcopenia Status

Parameter / Biomarker	Non-Sarcopenia Group (n=138)	Sarcopenia Group (n=62)	p-value	Statistical Test Method
Total Protein (g/l)	70.1 ± 3.8	63.2 ± 3.1	< 0.0001	Student's t-test
Albumin (g/l)	38.9 ± 2.9	32.8 ± 3.2	< 0.0001	Student's t-test
Prealbumin (mg/dl)	34.2 ± 1.2	29.1 ± 1.7	= 0.001	Student's t-test
Transferrin (g/l)	2.11 ± 0.37	1.61 ± 0.30	< 0.0001	Student's t-test
Total Cholesterol (mmol/l)	4.89 ± 1.24	4.21 ± 1.54	< 0.002	Student's t-test
Appendicular Metrics Index	29.8 ± 6.9	21.2 ± 4.4	< 0.0001	Student's t-test
Gait Speed (m/s)	1.3 ± 0.2	0.7 ± 0.2	< 0.0001	Mann-Whitney U-test

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Parameter / Biomarker	Non-Sarcopenia Group (n=138)	Sarcopenia Group (n=62)	p-value	Statistical Test Method
C-Reactive Protein (mg/l)	6.21 ± 4.24	13.36 ± 7.11	= 0.001	Mann-Whitney U-test
Body Fat Mass (kg)	21.2 ± 8.1	25.9 ± 5.9	= 0.001	Student's t-test

Discussion & Conclusion: Sarcopenia in rheumatic conditions is closely intertwined with severe nutritional deficiencies, marked by a critical decline in visceral proteins. The inverse increase in fat mass highlights the clinical presence of sarcopenic obesity, which remains hidden if relying solely on BMI. Monitoring the metabolic and protein spectrum is vital for tailoring personalized nutritional interventions.

Keywords: Sarcopenia, Nutritional status, Albumin, Prealbumin, Sarcopenic obesity

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