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Geriatric Syndromes in Polymyalgia Rheumatica: A Cross-Sectional Study

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ABSTRACT

Purpose: Polymyalgia rheumatica (PMR) is a common inflammatory disorder in the elderly. Geriatric syndromes as losses in activities of daily living, frailty, nutritional deficits and sarcopenia were conditions that become increasingly prevalent with age. Whilst PMR is a disease mostly affects geriatric population, there is a scarce data about PMR and possible accompanying geriatric syndromes. We examined prevalence of the accompanying geriatric syndromes in PMR patients and compare with age (±<5years) and sex matched controls.

Methods: Ten patients (8 female/2 male) diagnosed with PMR according to ACR/EULAR 2012 provisional PMR criteria and ten healthy controls were included to present study. Losses in activities of daily living was evaluated with Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs) Nutritional status were assessed with Mini-Nutritional Assessment Short Form (MNA-SF). Muscle strength evaluated with hand grip test. Patients with lowered muscle strength were labeled as probable sarcopenia according to The European Working Group on Sarcopenia in Older People (EWGSOP2) 2018.

Results: Mean hand grip strength was significantly lower in PMR patients (p=0.04) and probable sarcopenia was strikingly more common in patient group (p=0.01). Difference between the groups in terms of activities of daily living, nutritional status was non-significant.

Conclusion: Higher prevalence of sarcopenia was disclosed at immune mediated rheumatic disease patients in the previous studies. Current study indicates that PMR patients were significantly more prone to probable sarcopenia. Further efforts are needed to ameliorate the patients' care, quality of life and well-being.

ÖZET

Amaç: Polimiyalji romatika (PMR), yaşlılarda yaygın görülen bir inflamatuar hastalıktır. Geriatrik sendromlar, günlük yaşam aktivitelerindeki kayıplar, kırılganlık, beslenme yetersizlikleri ve sarkopeni gibi yaşla birlikte giderek yaygınlaşan durumları içerir. PMR çoğunlukla geriatrik popülasyonu etkileyen bir hastalık olmasına rağmen, PMR ve olası eşlik eden geriatrik sendromlar hakkında sınırlı veri bulunmaktadır. Çalışmamızda, PMR hastalarında eşlik eden geriatrik sendromların prevalansını inceledik ve bu verileri yaş (±5 yıl) ve cinsiyet açısından eşleştirilmiş sağlıklı kontrollerle karşılaştırdık.

Yöntem: ACR/EULAR 2012 PMR kriterlerine göre PMR tanısı almış on hasta (8 kadın/2 erkek) ve on sağlıklı kontrol çalışmaya dahil edildi. Günlük yaşam aktivitelerindeki kayıplar, Günlük Yaşam Aktiviteleri (ADLs) ve Enstrümantal Günlük Yaşam Aktiviteleri (IADLs) ile değerlendirildi. Beslenme durumu Mini Beslenme Değerlendirme Kısa Formu (MNA-SF) ile değerlendirildi. Kas gücü el kavrama testi ile ölçüldü. Kas gücü düşüklüğü tespit edilen hastalar, 2018 tarihli Avrupa Sarkopeni Çalışma Grubu (EWGSOP2) kriterlerine göre olası sarkopeni olarak sınıflandırıldı.

Bulgular: Ortalama el kavrama gücü PMR hastalarında anlamlı derecede daha düşüktü (p=0.04) ve olası sarkopeni hasta grubunda anlamlı bir şekilde daha yaygındı (p=0.01). Gruplar arasında günlük yaşam aktiviteleri ve beslenme durumu açısından fark anlamlı değildi.

Sonuç: Bu çalışma, PMR hastalarının olası sarkopeniye önemli ölçüde daha yatkın olduğunu göstermektedir. Hastaların bakımı, yaşam kalitesinin iyileştirilmesi için daha fazla çaba gerekmektedir.

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Polymyalgia rheumatica (PMR) is relatively common rheumatic condition in elderly population (1). The most frequent presentation is a new pain and stiffness, in the shoulders and hips with concomitant elevated acute phase reactants (2).

The hallmark of PMR is an exaggerated inflammatory response. Proinflammatory cytokines such as tumor necrosis factor-alpha (TNF-α), interleukin-1 beta (IL-1β), and interleukin-6 (IL-6) are elevated in PMR patients, reflecting systemic inflammation (3). IL-6, in particular, has been identified as a critical mediator of the inflammatory process, contributing to clinical symptoms and the acute phase response (4).

PMR predominantly affects individuals over 50 with the highest incidence occurring between the ages of 70 and 80 (5). This suggesting that age-related immune changes play a crucial role. "Inflammaging," a term describing chronic low-grade inflammation associated with aging, may amplify immune dysregulation in PMR (6). This includes shifts in monocyte and macrophage function, which may contribute to tissue-specific inflammation, particularly in the synovial and periarticular structures.

As individuals get older, they are at an increased risk of developing various geriatric syndromes, such as frailty, nutritional deficiencies, functional impairments in activities of daily living (ADL), sarcopenia—conditions that can impact their overall health, functional independence, and quality of life (7).

While PMR predominantly affects older adults, limited research examines the prevalence and impact of geriatric syndromes within this population. Understanding the overlap between PMR and these syndromes could enhance clinical management and patient outcomes.

We aimed to investigate the prevalence of the accompanying geriatric syndromes in PMR patients and compare them with age (±5 years) and sex-matched controls.

Methods

Study Participants

Potential patients were identified between December 2021 and November 2023 through an electronic medical record search of the Istanbul Research and Training Hospital using the International Classification of Diseases-10 (ICD-10) code for polymyalgia rheumatica (M35.3). Inclusion criteria included fulfilling the 2012 EULAR/ACR Classification Criteria for PMR, having a diagnosis within the previous 12 months, and currently being treated with glucocorticoids at any dose (8). Healthy controls were randomly chosen from individuals attending routine visits at the geriatric outpatient clinic. To ensure comparability, controls were matched with PMR patients based on age (±5 years) and sex. Exclusion criteria included a concurrent diagnosis of giant cell arteritis (GCA) or other inflammatory rheumatic diseases, as well as end-stage chronic kidney disease, chronic pulmonary disorders requiring oxygen therapy, active cancer, a history of solid organ transplantation, or HIV infection. The study was approved by the Ethical Committee of the Istanbul Research and Training Hospital (10.11.2023-307). A written consent was obtained from the participants for the present study.

Variables

Comorbid conditions were quantified by the Charlson Comorbidity Index (CCI) (9). Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs) were used to evaluate losses in activities of daily living (10,11). For ADLs, a score of 6 indicates full independence, 3–5 indicates partial dependence, and 2 or below is considered dependent (10).

For IADLs, a score of 8 indicates full independence, 4–7 indicates partial dependence, and 3 or below is considered dependent (11). Mini-Nutritional Assessment Short Form was used to assess the nutritional status (12). For the MNA-SF, a score of 0–7 indicates malnutrition, 8–11 indicates a risk of malnutrition, and 12–14 reflects normal nutritional status (12). Muscle strength was evaluated with a hand grip test. Patients with lowered muscle strength were labeled as probable sarcopenia, according to definition of The European Working Group on Sarcopenia in Older People (EWGSOP2) 2018 (13). The cut-off points for the hand grip test are <27 kg for men and <16 kg for women (13).

Statistical Analysis

Statistical analyses were performed using SPSS 20.0 software (IBM Corp., Armonk, NY, USA). The Shapiro-Wilk test was applied to assess the normality of data distribution. Normally distributed continuous variables

were expressed as mean ± standard deviation, while categorical variables were reported as median (IQR). Group comparisons were conducted using either the Student's t-test or the Mann-Whitney U test, based on the data distribution. Fisher's exact test was employed for analyzing categorical variables. A p-value of <0.05 was considered statistically significant.

Results

Thirteen patients with PMR were identified. Of the 13 eligible patients, ten subjects (8 female/2 male) accepted to participate in the present study. Age (±5 years) and sex-matched healthy controls were randomly selected from a geriatric outpatient unit in the same hospital.

The mean age was 75 ± 7.9 years for patients and 75.7 ± 7.9 years for controls, with no significant difference between the groups (p = 0.90). The mean PMR duration was 12,5 ± 8,9 months in the patient group. No participant was using concomitant prednisolone in the healthy control group. The median (IQR) Charlson comorbidity index was 5 (4-6) in the patient group, whereas it was 3 (4-5) (p=0,01) in healthy controls. The baseline characteristics of the patients and controls are depicted in Table 1.

Table 1: Baseline characteristics of the patients and controls.

Characteristics	PMR Patients	Controls	P
Sex, (n) Male Female	 2 8	 2 8	0,99
Age, mean±SD, years	75 ± 7,9	75,7 ±7,9	0,90
Prednisolone*, (n) Ever Never	 10 0	 0 10	N/A
PMR duration, mean±SD, months	12,5 ± 8,9	N/A	N/A
CCI**, median (IQR)	5 (4-6)	3 (3-4)	0,01

**Prednisolone ≥5 mg/day more than 3 months*
***Charlson Comorbidity Index*

The mean ADLs and IADLs were 5,7 ± 0,9 and 7,4 ±1,5 in the patient group, while 5,8 ± 0,4 and 7,1 ±2,1 in the control group (p=0,79 and p=0,73, respectively). The mean MNA-SF score was higher in the patient's group (11,4 ± 1,8 vs. 9,6 ± 3,1, respectively); however, it was not statistically significant (p=0,22). Mean hand grip strength was significantly lower in PMR patients (18,5 ± 8,6 vs 23,5 ± 3,9, respectively) (p=0,04). Six (%60) of the 10 PMR patients had probable sarcopenia according to muscle strength, and none in the control group (p=0,01). Geriatric syndromes in PMR patients and controls are depicted in Table 2.

Table 2: Geriatric syndromes in PMR patients and controls.

	PMR Patients (n=10)	Controls (n=10)	P
ADLs,mean±SD	5,7 ± 0,9	5,8 ± 0,4	0,79[ε]
IADLs, mean±SD	7,4 ± 1,5	7,1 ± 2,1	0,73[ε]
MNA-SF, mean±SD	11,4 ± 1,8	9,6 ± 3,1	0,22[ε]
Muscle strength, kg	18,5 ± 8,6	23,5 ± 3,9	**0,04**[ε]
Probable sarcopenia, n	6	0	**0,01**[λ]

[ε]Mann Whitney U Test, [λ]Fisher's exact test, SD standard derivation, ADLs Activities of Daily Living, IALDs Instrumental Activities of Daily Living, MNA-SF Mini-Nutritional Assessment Short Form

Discussion

PMR is an inflammatory connective tissue disorder that presents with morning stiffness of the girdle muscles and B symptoms in particularly women patients over age 50 years. Since the disease is common in the geriatric population, there is scarce data regarding the prevalence and impact of accompanying geriatric syndromes such as ADL loss, frailty, nutritional deficits, and sarcopenia in this group.

In our study, we demonstrated that probable sarcopenia, one of the geriatric syndromes, was significantly more frequent in the PMR group compared to controls. As far as we know, there has yet to be a study investigating the association between PMR and sarcopenia using the EWGSOP2 criteria. Sattui et al. diagnosed sarcopenia in 26% of PMR patients (14). Their study assessed sarcopenia using the dual-energy X-ray (DXA) method. However, according to the EWGSOP2 criteria, muscle strength is now prioritized for sarcopenia diagnosis, and the condition is defined as either sarcopenia or probable sarcopenia based on muscle mass measurements.

Inflammatory cytokines (e.g., IL-6, TNF-α, IL-1β) promote muscle protein breakdown and inhibit muscle synthesis, contributing to sarcopenia (15). Additionally, prednisolone is the mainstay treatment model for PMR management through exacerbated sarcopenia through multiple mechanisms, including increasing protein catabolism, a-inducing mitochondrial dysfunction (resulting in reduced energy production and muscle weakening), b-activating myostatin (leading to muscle mass and strength loss), and c-causing oxidative stress and inflammation (16-18). Given that both the disease itself and its treatment can impair muscle strength and mass which makes screening sarcopenia is crucial for patients with PMR.

The relationship between PMR and the Mini Nutritional Assessment-Short Form (MNA-SF) underscores the potential impact of inflammation and functional impairments commonly seen in PMR on nutritional status. Inflammation and mobility limitations can increase the risk of malnutrition and lower MNA-SF scores (19). Although MNA-SF scores were higher in the PMR group, the difference was not statistically significant, and both groups were categorized as at risk of malnutrition based on the MNA-SF. nutritional screening and management during PMR diagnosis are vital. Sarcopenia and malnutrition often create a vicious cycle that exacerbates one another. This interplay can lead to functional losses, increased dependency, and higher mortality risk in geriatric patients (20).

The Charlson Comorbidity Index (CCI) in our study was significantly higher in the PMR group. The contribution of PMR itself to the CCI score likely explains this difference.

Limitations

The limited number of participants and its single center design were the limitations of the present study.

Conclusion

In conclusion, both the disease process and its treatment contribute to sarcopenia in PMR patients. Therefore, individuals diagnosed with PMR should undergo screening for probable sarcopenia, and if identified, appropriate care should be initiated.

Given the significant overlap between PMR and these syndromes, further research is essential to understand how these conditions interact and to guide clinicians in providing comprehensive care to improve outcomes for patients with PMR.

Declarations

Funding

This study has no external funding.

Conflicts of Interest/Competing Interests

The authors declare that they have no conflicts of interest.

Ethics Approval

The study was approved by the Ethical Committee of the Istanbul Research and Training Hospital (10.11.2023-307).

Authors' Contributions

MO and VS conceptualized and designed the study. MO organized the database, performed the statistical analysis. MO and VS wrote the first draft of the manuscript. MO edited the final version of the paper. All authors approved the final version of the manuscript.

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N/A

Accessibility of the data and materials (data transparency):

Authors can share the data upon a reasonable request.

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