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Polymyalgia Rheumatica: Clinical Features and Third Month Treatment Responses-A Single-Center Experience

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ABSTRACT

Introduction: This study aimed to evaluate the clinical features, comorbidities, and third month treatment responses of polymyalgia rheumatica (PMR) patients followed in a single rheumatology unit.

Methods: Thirteen patients diagnosed with PMR based on the 2012 European League Against Rheumatism/American College of Rheumatology Classification Criteria were retrospectively analyzed. Baseline demographics, clinical, and laboratory findings, positron emission tomography-computed tomography (PET-CT) results, and treatment responses at the third month were reviewed.

Results: A total of 13 patients (3 male/10 female) were included in the present study. The mean age of the cohort was 76±7.3 years, with a female predominance (76%). Morning stiffness was the most frequent symptom (100%), followed by shoulder pain (92%) and groin pain (38%). PET-CT revealed periarticular F-fluorodeoxyglucose uptake in 92% of cases, with no evidence of vasculitis. Prednisolone therapy was initiated in all patients, and significant symptom relief, and reductions in C-reactive protein levels were observed by the third month (p=0.02).

Conclusion: PMR frequently overlaps with other conditions, complicating its diagnosis. PET-CT can be a valuable tool in identifying periarticular inflammation but remains limited by its cost. Prednisolone therapy was effective in achieving rapid symptom relief, although clinicians must remain cautious about its long-term adverse effects, particularly in geriatric populations.

Keywords: Polymyalgia rheumatica, PET-CT, vasculitis

Introduction

Polymyalgia rheumatica (PMR) is a relatively common rheumatic condition in the elderly population (1). PMR predominantly affects individuals over 50, with the highest incidence occurring between the ages of 70 and 80 (2). Despite its high prevalence in elderly populations, the exact etiology of PMR remains unclear, while activation of innate and adaptive immune systems in response to unknown environmental triggers appears to be a plausible pathogenesis (3).

PMR is typically diagnosed based on clinical presentation, supported by elevated inflammatory markers such as erythrocyte sedimentation rate and C-reactive protein (CRP) (4). However, its diagnosis can be challenging due to the absence of specific diagnostic tests and its clinical similarities with other inflammatory and non-inflammatory conditions, such as myositis, seronegative rheumatoid arthritis, calcium pyrophosphate disease, frozen shoulder, fibromyalgia, spondylosis, osteoarthritis, and even malignancies (5,6). These overlapping features frequently lead to delayed diagnosis, which in turn prolongs patient suffering and may lead to unnecessary investigations or inappropriate treatments.

PMR frequently coexists with giant cell arteritis (GCA), another inflammatory condition that primarily affects large and medium-sized arteries. Studies suggest that approximately 20% of PMR patients may develop GCA, and up to 40-50% of GCA patients present with PMR-like symptoms (7-9). However, PMR can also occur as an isolated condition without any vascular involvement. This variability highlights the importance of distinguishing between isolated PMR and cases complicated by GCA, as the latter requires more aggressive monitoring and treatment to prevent severe vascular complications of the large-vessel vasculitis (10).

Recent advancements in imaging modalities have provided a better understanding of the disease's possible organ involvements. Ultrasound is widely used to detect subdeltoid bursitis, biceps tenosynovitis, and hip synovitis, which are characteristic of the disease (11,12). Moreover, fluorodeoxyglucose positron emission tomography/computed tomography (PET-CT) has emerged as a powerful tool to identify inflammatory changes in extra-articular sites, including both vascular and periarticular structures (13,14).

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Corticosteroids remain the cornerstone of PMR treatment, providing rapid symptomatic relief (4). However, long-term steroid use is associated with considerable side effects, necessitating a careful balance between disease control and minimizing treatment-related complications.

This study was evaluated presentation characteristics, PET-CT findings and treatment responses of the therapy at the 3rd month of the PMR patients followed in a single rheumatology unit.

Methods

Study Participants

Potential patients were identified between December 2021 and November 2023 through an electronic medical record search of the University of Health Sciences Türkiye, İstanbul Training and Research Hospital using the International Classification of Diseases-10 (ICD-10) code for PMR (M35.3). The study population was identified through a review of patient records using the ICD-10 code for PMR (M35.3). Inclusion criteria required fulfilling the 2012 European League Against Rheumatism/American College of Rheumatology Classification Criteria for PMR (15). Clinical features at presentation and PET/CT findings were retrieved from the electronic medical records. Patients were reevaluated three months after the therapy began. There were no exclusion criteria for the present study. The study was conducted in full compliance with the principles outlined in the Declaration of Helsinki, and it was conducted after obtaining approval from the University of Health Sciences Türkiye, İstanbul Training and Research Hospital Clinical Research Ethics Committee (approval number: 267, date: 13.10.2023).

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. Continuous variables are presented as mean ± standard deviation (SD) if they follow a normal distribution and as median [interquartile range (IQR)] if they do not. Categorical variables are presented as percentages. Group comparisons were conducted using either the paired sample t-test or the Wilcoxon test, based on the data distribution. The McNemar test was employed for analyzing categorical variables. A p-value of <0.05 was considered statistically significant.

Results

A total of 13 patients (3 male/10 female) were included in the present study. The mean age at diagnosis was 76±7.3 years. The baseline demographics, clinical, and laboratory findings at presentation are presented in Table 1.

Clinical and Laboratory Characteristics and Comorbid Conditions

All the 13 patients (100%) described morning stiffness, which was the most common complaint. Twelve (92% out of the cohort) patients had shoulder pain. Five patients (38%) had groin pain. Five (38%) of the 13 patients had peripheral arthralgia while three (23%) of these had arthritis. None of the patients described any previous headache.

One patient (7%) had a positive rheumatoid factor test, which was 22 IU/l (normal <14 IU/l). None of the patients had anti-cyclic citrullinated peptides test positivity. Five cases had a positive antinuclear antibodies test; however, four of them were borderline positive, and the remaining

Table 1. Baseline demographics, comorbidies, clinical and laboratory findings of the PMR patients

Age of diagnosis, years, mean ± SD	76±7.3
Male, n (%)	3 (24)
Female, n (%)	10 (76)
Comorbidity, n (%) Hypertension Diabetes Coronary heart disease Osteoporosis Solid organ malignancy Monoclonal gammopathy of undetermined significance	 11 (85) 3 (23) 3 (23) 5 (38) 1 (8) 1 (8)
Stiffness, n (%)	13 (100)
Shoulder pain, n (%)	12 (92)
Groin pain, n (%)	5 (38)
Peripheral arthralgia, n (%)	5 (38)
Peripheral arthritis, n (%)	3 (23)
Headache, n (%)	0 (0)
RF positive cases, n (%)	1 (7)
Anti-CCP positive cases, n (%)	0 (0)
ANA positive cases, n (%)	5 (38)
CRP, mg/L, median (IQR)	26.5 (16-47.25)
Sedimentation, mm/h, median (IQR)	64 (37-92.5)

SD: Standard deviation, RF: Rheumatoid factor, Anti-CCP: Anti-Cyclic citrullinated peptides, ANA: Antinuclear antibodies CRP: C-reactive protein, IQR: Interquartile range, PMR: Polymyalgia rheumatica

patient had a 1/160 homogeneous pattern. The median (IQR) sedimentation and CRP levels were 64 (37-92.5) mm/h and 26.5 (16-47.25) mg/L, respectively.

Hypertension and diabetes were observed at the time of PMR diagnosis in 11 (85%) and 3 (23%) patients, respectively. Three (23%) patients had coronary heart disease. Five patients (38%) had osteoporosis. One patient (8%) had previous breast cancer, and another (8%) had monoclonal gammopathy of undetermined significance before PMR diagnosis.

Positron Emission Tomography-Computed Tomography Findings and Clinical Correlation

Twelve (92%) of the 13 patients had periarticular F-fluorodeoxyglucose (FDG) uptake in a PET-CT scan. None of the patients had subclinical large vessel involvement. Of the five patients who presented with peripheral arthralgia, three (60%) had periarticular FDG uptake at peripheral joints. The remaining two patients had no uptake at peripheral joints. Additionally, one of these remaining two patients had wrist arthritis. PET-CT characteristics of the PMR patients were presented in Table 2.

Treatment Responses

Except for one patient, all others were treated with prednisolone. The remaining patient (patient number: 6 in Table 2) with previous breast cancer presented with PMR complaints, and she was diagnosed with a relapse of the breast cancer and PMR. She was treated with paclitaxel and trastuzumab. The mean ± SD prednisolone was 14.5±1.5 mg/day for the remaining patients.

At the end of the 3rd month of the therapy, only two patients still had PMR-related complaints (p=0.01). The median (IQR) CRP level dropped significantly at the control visit [26.5 (16-47.25) mg/L vs. 5 (2.5-9.5) mg/L, p=0.01]. The mean ± SD prednisolone dose was lowered from 14.5±1.5 mg/day to 4.5±2.9 mg/day at 3rd month of the treatment (p=0.0001). None of the patients was treated with additional immunosuppressants except prednisolone. The Treatment responses and prednisolone doses at the 3rd month of the therapy are depicted in Table 3.

Discussion

PMR is increasingly becoming a condition that clinicians encounter, particularly with the aging population. The absence of a diagnostic serological test, coupled with the overlap with other seronegative arthritides and age-related degenerative joint diseases, often leads to diagnostic delays.

Radiological imaging plays a crucial role in diagnosing PMR. Ultrasound stands out as a practical, cost-effective, and safe method. It is highly effective in detecting underlying extra-articular soft tissue involvement, with bursitis and tenosynovitis being the most common findings (11,12). Although MRI is also successful in identifying extra-articular involvement, its high cost limits its routine use (16). PET-CT, while not yet recommended for all suspected cases, has shown significant utility in detecting both extra-articular and potential vascular involvement (13,14). In a study by Blockmans et al. (17), subclinical vasculitis was identified in approximately one-third of patients using PET-CT. One of the factors influencing the success of imaging techniques is prior steroid use, which can reduce the accuracy of imaging findings (18). In our study, none of the patients received steroid treatment before imaging, and PET-CT positivity was detected in 92% of the cases (12 out of 13 patients). No subclinical vasculitis was observed. There are scant data from Türkiye, specifically investigating PET-CT involvement in PMR patients, whereas two recent papers have examined this in GCA. Both studies reported vasculitis in approximately 80% of patients (19,20).

Prednisolone is a highly effective treatment modality for PMR. All patients in our study responded to prednisolone treatment by the third month, reporting no PMR-related symptoms. Despite its effectiveness, clinicians must remain vigilant about the long-term side effects of steroid use. As PMR is more prevalent in the geriatric population, this group is particularly vulnerable to potential adverse effects. In our cohort, comorbidities such as hypertension and osteoporosis, which can be exacerbated by steroid therapy, were present in 85% and 38% of patients, respectively. The literature also supports increased risks of hypertension, osteoporosis, and glaucoma in PMR patients undergoing

Table 2. Clinical and PET-CT characteristics of the PMR patients

Patient number	Age (years)	Sex	Shoulder pain	Groin pain	Peripheral arthralgia	Peripheral arthritis	PET-CT findings (areas with increased FDG uptake)
1	84	M	+	-	-	-	Both shoulders
2	75	F	+	-	+	-	Both shoulders and elbows
3	73	F	+	-	-	-	Both shoulders and elbows
4	72	F	+	-	-	-	None
5	83	F	+	+	-	-	Both shoulders and hips
6	59	F	+	+	-	-	Both shoulders and hips
7	65	F	+	+	+	+	Right shoulder
8	79	M	+	-	+	+	Both shoulders, wrists, hips and knees
9	86	F	+	-	-	-	Both shoulders and hips and posterior part of the L5
10	78	F	+	+	+	+	Both shoulders and knees
11	75	F	+	-	+	-	Both shoulders and hips
12	80	M	+	-	-	-	Both shoulders, elbows and wrists
13	79	F	+	-	-	-	Both shoulders, elbows and wrists

M: Male, F: Female, CRP: C-reactive protein, PET-CT: Positron emission tomography-computed tomography, FDG: F- fluorodeoxyglucose, PMR: Polymyalgia rheumatica

Table 3. Treatment responses and prednisolone doses at the 3rd month of the therapy

	Initial	3rd month	p value
Any symptoms related with PMR, n (%)	13	0	0.0001
CRP, median (IQR), mg/L	26.5 (16-47.25)	5 (2.5-9.5)	0.01
Prednisolone dose*, mean ± SD, mg/day	14.5±1.5	4.5±2.9	0.0001

*Twelve of the 13 patients were treated with prednisolone, SD: Standard deviation, IQR: Interquartile range, CRP: C-reactive protein, PMR: Polymyalgia rheumatica

prednisolone therapy (21). While some studies have suggested an association between PMR and increased malignancy risk, conflicting evidence indicates that no definitive link has been established.

In cases where prednisolone therapy is unsuccessful, clinicians should consider the possibility of concomitant GCA and investigate potential vasculitis. Methotrexate and IL-6 inhibitors may be viable alternatives in cases where prednisolone is inadequate (22-24).

Study Limitations

Our study is limited by its single-center design, the small sample size, and the short follow-up period.

Conclusion

In conclusion, our findings highlight several critical aspects of PMR diagnosis and management. Educating clinicians about the nuanced presentation of PMR and the importance of differential diagnosis can play a crucial role in early detection.

Ethics

Ethics Committee Approval: The study was conducted in full compliance with the principles outlined in the Declaration of Helsinki, and it was conducted after obtaining approval from the University of Health Sciences Türkiye, İstanbul Training and Research Hospital Clinical Research Ethics Committee (approval number: 267, date: 13.10.2023).

Informed Consent: Retrospective study.

Footnotes

Conflict of Interest: No conflict of interest was declared by the authors.

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