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Referral Characteristics and Outcomes in Rheumatology Outpatient Referrals: A Single-Center Observational Study

Sonat Pınar Kara[1], Dilara Bulut Gökten[2], İlknur Kara[1], Rıdvan Mercan[2]

[1]Tekirdag Namik Kemal University, Department of Internal Medicine, Tekirdağ, Türkiye
[2]Tekirdag Namik Kemal University, Department of Rheumatology, Tekirdağ, Türkiye

Abstract

Introduction: Referrals to rheumatology outpatient clinics have increased worldwide, contributing to prolonged waiting times and challenges in accessing specialized care. A substantial proportion of referred patients ultimately do not receive a rheumatologic diagnosis, often due to nonspecific complaints or inappropriate referral indications. This study aimed to evaluate referral patterns, diagnostic yield, and clinical outcomes according to referral source in a rheumatology outpatient clinic.

Materials and Methods: This retrospective single-center observational study included 400 patients over a nine-month period. Demographic characteristics, referral reasons, referral sources, laboratory parameters and final diagnoses were recorded. Comparative statistical analyses were performed between referral groups. Firth's penalized logistic regression analysis was additionally used to address quasi-complete separation in multivariable analysis.

Results: Overall, 79.3% of patients received a rheumatologic diagnosis. Internal medicine accounted for the majority of referrals (75.8%) and demonstrated a significantly higher diagnostic yield compared with primary care referrals (91.4% vs. 53.1%, $p < 0.001$). Crystal-induced arthropathies represented the most frequent diagnostic category, followed by spondyloarthritis spectrum disorders and rheumatoid arthritis. ANA positivity was significantly associated with rheumatologic diagnosis. Using Firth's penalized logistic regression, referral from internal medicine remained independently associated with rheumatologic diagnosis (OR 5.03, 95% CI 2.38–10.61, $p < 0.001$), while ANA positivity was also independently associated (OR 3.28, 95% CI 1.15–9.34, $p = 0.026$).

Conclusion: Referral source is associated with substantial differences in diagnostic yield in rheumatology outpatient care. These findings likely reflect variations in pre-referral evaluation rather than intrinsic differences in diagnostic accuracy. Structured referral strategies and standardized triage approaches may help optimize specialist resource utilization.

Key words: Outpatient Clinics; hospital; outpatients; referral and consultation; rheumatology

Introduction

Globally, referrals to rheumatology outpatient clinics have been steadily increasing, leading to prolonged waiting times and challenges in timely access to specialized care(1). In inflammatory rheumatic diseases (IRD), early diagnosis and the timely initiation of disease modifying therapies are essential for improving long-term clinical outcomes(2). However, previous studies have demonstrated that a substantial proportion of patients referred to rheumatology clinics ultimately do not receive a definitive rheumatologic diagnosis. Most referrals are prompted by nonspecific musculoskeletal complaints, isolated abnormalities detected in serological testing or chronic pain syndromes, many of which can be appropriately managed in non-rheumatology settings(3). This situation contributes to inefficient use of healthcare resources and may lead to delays in diagnosis and treatment for patients with true inflammatory diseases. Recent studies have evaluated the diagnostic yield of referrals to rheumatology services across different clinical settings. Retrospective cohort analyses have reported lower rates of confirmed IRD among patients referred from internal medicine or general practice clinics, with a higher prevalence of non-inflammatory conditions such as fibromyalgia and mechanical musculoskeletal disorders(4). These findings suggest that the referring department may have a significant influence on diagnostic outcomes. To address the growing demand for rheumatology services, several structured triage and preliminary evaluation strategies led by non-specialist

*Corresponding Author: Dilara Bulut Gökten 59059, Tekirdag, Türkiye
Orcid: Sonat Pınar Kara 0000-0002-8018-4879, Dilara Bulut Gökten 0000-0002-9226-7532, İlknur Kara 0009-0009-9692-6345
Rıdvan Mercan 0000-0003-1537-2192

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physicians have been introduced. Available data support the ability of these models to appropriately stratify patients, ensuring timely specialist referral for inflammatory cases while allowing non-inflammatory conditions to be managed in primary or internal medicine care(4). Machine learning-based triage models have been shown to outperform traditional referral algorithms in detecting IRD, enabling more accurate prioritization of patients requiring specialist evaluation(5). Nevertheless, the absence of shared clinical criteria and standardized referral algorithms in rheumatology care has led to substantial heterogeneity between clinics, reducing the predictability of patient flow. The implementation of structured referral protocols has been reported to facilitate prioritization of patients with IRD while decreasing unnecessary specialist consultations(6, 7). Studies directly comparing diagnostic outcomes of patients referred to rheumatology services from different clinical departments, such as orthopedics, internal medicine and primary care, remain limited. Clarifying the impact of referral source on the likelihood of establishing a rheumatologic diagnosis is essential for optimizing referral pathways(8). This study sought to investigate how referral source influences diagnostic yield in rheumatology outpatient care and to identify differences in clinical outcomes among patients referred from various medical specialties.

Materials and Methods

Study design and study population: This single-center observational cohort study retrospectively evaluated patients referred to the rheumatology outpatient clinic from various clinical departments over the past nine months. A total of 400 patients who completed clinical assessment in the rheumatology clinic were included. Patients with incomplete clinical or laboratory data were excluded. Due to the limitations in record completeness, the exact number of excluded patients could not be determined. Demographic characteristics (age and sex), referral reasons, referring departments, laboratory parameters and final diagnoses established in the rheumatology clinic were obtained from the institutional patient record system. Sex data were extracted from the institutional electronic medical record system. This observational study was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.

Diagnostic procedures and laboratory assessments: Rheumatologic diagnoses were established by rheumatology specialists based on clinical examination findings, laboratory investigations and imaging studies when indicated. Diagnoses were made in accordance with relevant international classification criteria. Rheumatologic diagnoses included both inflammatory and non-inflammatory conditions. For patients who did not receive a rheumatologic diagnosis, alternative clinical diagnoses were recorded according to information documented in medical records. Final diagnoses were categorized into standardized groups for analysis. These included: IRD, non-inflammatory rheumatic conditions (fibromyalgia, osteoarthritis) and crystal-induced arthropathies (including gout and related conditions). Referral reasons were categorized into two main groups: referrals based on suspicion of a specific rheumatologic disease and referrals prompted by nonspecific complaints and further categorized into clinically relevant subgroups, including: suspected IRD, mechanical or nonspecific musculoskeletal complaints (joint pain, low back pain, widespread pain), serology-driven referrals (isolated ANA, RF or anti-CCP positivity) and systemic or other complaints. Routine biochemical and immunological parameters were evaluated in all patients. Inflammatory markers, including C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) were recorded. Autoimmune markers assessed comprised rheumatoid factor (RF), anti–cyclic citrullinated peptide antibody (anti-CCP), antinuclear antibody (ANA), extractable nuclear antigen (ENA) profile and antineutrophil cytoplasmic antibody (ANCA). Serum uric acid levels were also documented. RF and anti-CCP tests were not performed routinely in all patients but were ordered selectively according to clinical suspicion. Therefore, positivity rates were calculated based on the number of tested patients rather than the total cohort.

Statistical analysis: All consecutive patients meeting the inclusion criteria during the study period were included, and no a priori sample size calculation was performed due to the nature of the study. A post hoc power analysis was performed to assess the adequacy of the sample size. Based on the difference in diagnostic yield between internal medicine and primary care referrals, the analysis demonstrated a statistical power of 0.88 at a significance level of $\alpha = 0.05$. Statistical analyses were performed using IBM SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY, USA) The distribution of continuous variables was assessed using the Kolmogorov–Smirnov test. Normally distributed data were presented as mean

Table 1: Demographic characteristics and referral profile of the patients (N = 400)

Variable	n (%)
Age (years)	
Median (IQR)	49 (23.25)
Sex	
Female, n (%)	302 (75.5)
Male, n (%)	98 (24.5)
Referring clinic	
Internal medicine	303 (75.8)
Primary care center	32 (8.0)
Dermatology	17 (4.2)
Physical medicine and rehabilitation	10 (2.5)
Orthopedics	10 (2.5)
Other specialties*	28 (7.0)
Reason for referral	
Joint pain	321 (80.2)
Low back pain	17 (4.2)
Widespread pain	13 (3.2)
Suspicion of a specific rheumatologic disease	23 (5.8)
Other reasons**	26 (6.6)

***** Other specialties: Neurology, pulmonology, ophthalmology, neurosurgery, hematology, cardiology and gynecology. ******Raynaud's phenomenon, pericardial effusion, thrombosis, oral ulcers, rash, dyspnea etc.

± standard deviation, while non-normally distributed variables were expressed as median and interquartile range (IQR). Comparisons between two groups were conducted using the independent samples t-test for normally distributed variables and the Mann–Whitney U test for non-normally distributed variables. Relationships between categorical variables were determined with the Chi-square test or Fisher's exact test when appropriate. Associations between referral source, referral reason, laboratory markers and rheumatologic diagnostic outcomes were evaluated through comparative analyses. Multivariable logistic regression analysis including referral source, CRP, ESR, ANA, ENA, age and sex was initially planned. However, due to quasi-complete separation and model instability, particularly related to the strong predictive effect of referral source and perfect prediction in some variables (ENA positivity), the multivariable model did not yield reliable estimates. Therefore, results from multivariable analysis were not reported. A p-value of less than 0.05 was considered statistically significant.

Ethics committee approval: Ethical approval for the study was obtained from the local ethics committee (approval date: 24.02.2026 and approval number: 2026.57.02.29). The study was conducted in accordance with the principles of the Declaration of Helsinki. The study utilized existing clinical records, and no patient recruitment or intervention was performed after the ethics approval date. Due to the design of the study, requirement for individual informed consent was waived by the ethics committee.

Results

A total of 400 patients were included in the study. The median age was 49 years (IQR: 23.25). The majority of the cohort consisted of female patients (n = 302, 75.5%), whereas 98 patients (24.5%) were male. The median age was 50 years (IQR: 22.8) among women and 47.5 years (IQR: 24.7) among men, with no statistically significant difference observed (p = 0.27). Analysis of referral indications revealed that most patients were referred due to nonspecific musculoskeletal complaints. Joint pain was the predominant reason for referral, reported in 80.2% of cases (n = 321). Other common complaints included low back pain (4.2%), generalized pain (3.2%), abdominal pain (1.8%), dyspnea (1.0%) and oral aphthous lesions (0.8%). A detailed evaluation of referral indications demonstrated that only approximately 5.8% of patients were referred with suspicion of a specific rheumatologic disease, including rheumatoid arthritis (RA), psoriatic arthritis (PsA), familial Mediterranean fever (FMF), ankylosing spondylitis (AS), connective tissue diseases (CTD) and vasculitis. The vast majority of referrals were based on general complaints such as joint pain without a targeted diagnostic suspicion. Regarding referral sources, internal medicine departments accounted for the largest proportion of referrals (75.8%). Primary care centers constituted the second most common source (8%), followed by dermatology (4.2%), physical medicine and rehabilitation (2.5%) and orthopedics (2.5%) (see Table 1). The overall rate

Table 2: Distribution of final diagnoses among patients with a rheumatologic diagnosis (N = 317)

Diagnosis category	n	%
Inflammatory rheumatic diseases		
Spondyloarthritis spectrum (total)	42	12.3
Rheumatoid arthritis	37	10.8
Connective tissue diseases	34	9.9
Psoriatic arthritis	20	5.8
Ankylosing spondylitis	13	3.8
Familial Mediterranean fever	7	2.0
Sjögren syndrome	7	2.0
Other diagnoses*	33	10.4
Subtotal (inflammatory)	193	60.9
Crystal arthropathies		
	96	30.2
Non-inflammatory rheumatic conditions		
Fibromyalgia	19	5.6
Osteoarthritis	9	2.6
Subtotal (Non-inflammatory)	28	8.8

*****Other diagnoses: Systemic lupus erythematosus, systemic sclerosis, dermatomyositis, Behçet's disease, polymyalgia rheumatica, reactive arthritis, enteropathic arthritis, RS3PE etc.

Table 3: Rates of rheumatologic diagnoses and inflammatory markers according to referral source

Referral source	Total (N)	Rheumatologic diagnosis n (%)	No rheumatologic diagnosis n (%)	CRP, median (IQR) mg/L	ESR, median (IQR) mm/s
Internal Medicine	303	277 (91.4)	26 (8.6)	3.66 (7.82)	11.0 (16.0)
Primary care center	32	17 (53.1)	15 (46.9)	1.56 (4.68)	6.5 (10.25)
Dermatology	17	14 (82.4)	3 (17.6)	5.74 (–)	15.4 (–)
Physical medicine and rehabilitation	10	7 (70.0)	3 (30.0)	3.79 (–)	13.9 (–)
Orthopedics	10	7 (70.0)	3 (30.0)	20.6 (–)	18.8 (–)

Comparison between internal medicine and primary care center. Rheumatologic diagnosis rate: $p < 0.001$ and (CRP: $p = 0.042$; ESR: $p = 0.029$) Due to the limited number of patients in some subgroups (dermatology, physical medicine and rehabilitation and orthopedics), median and interquartile range (IQR) values were not reported and only descriptive statistics are presented. CRP, C-reactive protein; ESR, erythrocyte sedimentation rate

of confirmed rheumatologic diagnoses within the cohort was 79.3% (n = 317), while 20.7% of patients (n = 83) did not receive a rheumatologic diagnosis. Diagnostic yield varied significantly according to referral source. Among patients referred from internal medicine departments, 91.4% were diagnosed with a rheumatologic condition, compared with 82.4% of those referred from dermatology clinics. In contrast, the diagnostic rate among patients referred from primary care centers was substantially lower at 53.1%, with this difference reaching statistical significance ($p < 0.001$). Among patients who received a rheumatologic diagnosis, crystal-induced arthropathies represented the most frequent disease category, accounting for 30.2% of all diagnoses. This was followed by the spondyloarthritis spectrum (12.3%), RA (10.8%) and CTD (9.9%). Other commonly identified conditions included PsA (5.8%), fibromyalgia (5.6%), AS (3.8%), osteoarthritis (2.6%) and FMF (2.0%). Less frequent diagnoses comprised systemic lupus erythematosus, systemic sclerosis, dermatomyositis, Behçet's disease, and polymyalgia rheumatica. Among patients without a rheumatologic diagnosis, the most common alternative diagnoses were mechanical pain (25.9%), myalgia (13.8%), and lumbar disc herniation (17.3%) (see Table 2). Laboratory analyses demonstrated positivity rates of 84.8% for RF, 82.5% for anti-CCP, 21.8% for ANA and 7.8% for ENA. RF positivity was observed in 287 of 339 tested patients, while anti-CCP positivity was detected in 272 of 330 tested patients. No significant association was observed between rheumatologic diagnosis and positivity for RF or

anti-CCP antibodies (p = 0.796 and p = 0.211, respectively). In contrast, patients with positive ANA results exhibited a significantly higher rate of rheumatologic diagnosis compared with ANA-negative patients (94.3% vs. 83.1%, p = 0.014). All patients with ENA positivity were diagnosed with a rheumatologic condition, demonstrating a statistically significant association (p = 0.034). When inflammatory markers were evaluated according to referral source, patients referred from internal medicine clinics showed significantly higher CRP and ESR levels compared with those referred from primary care centers. The median CRP level was 3.66 mg/L (IQR: 7.82) in the internal medicine group and 1.56 mg/L (IQR: 4.68) in the primary care group (p = 0.042). Similarly, median ESR values were higher among internal medicine referrals (11.0 mm/h vs. 6.5 mm/h, p = 0.029). Serum uric acid levels across the entire cohort showed a mean of 5.08 ± 1.57 mg/dL and a median of 5.0 mg/dL (IQR: 2.2), with no significant differences observed between referral sources. Although patients referred with suspicion of a specific IRD demonstrated a higher diagnostic rate compared with those referred for non-specific complaints (93.3% vs. 84.9%), this difference did not reach statistical significance (p = 0.319) (see Table 3). When referral indications were further classified, the majority of patients were referred due to mechanical or nonspecific musculoskeletal complaints. A smaller proportion of referrals were driven by suspicion of IRD or abnormal serological findings. When diagnoses were classified into standardized categories, non-inflammatory conditions represented 8.8%. IRD excluding crystal-induced arthropathies accounted for 60.9% of all rheumatologic diagnoses, while crystal-induced arthropathies represented 30.2% of cases Univariable logistic regression analysis did not identify age, sex, CRP or ESR as significant predictors of a rheumatologic diagnosis. The models demonstrated instability with extremely wide confidence intervals. The diagnostic yield differed significantly according to referral source. Patients referred from internal medicine had a markedly higher rate of rheumatologic diagnosis compared to other referral groups (91.4% vs. 67.0%, p < 0.001). Patients referred from internal medicine had significantly higher odds of receiving a rheumatologic diagnosis compared to other referral sources (OR 5.99, 95% CI 3.29–10.92, p < 0.001). Using Firth's penalized logistic regression to address quasi-complete separation, referral from internal medicine remained independently associated with a higher likelihood of receiving a rheumatologic diagnosis (OR 5.03, 95% CI 2.38–10.61, p < 0.001). ANA positivity was also independently associated with rheumatologic diagnosis (OR 3.28, 95% CI 1.15–9.34, p = 0.026). Age, sex, CRP and ESR were not significant predictors.

Discussion

This study represents one of the few evaluations of referral patterns, diagnostic yield and clinical outcomes among patients referred to rheumatology outpatient clinics. A key contribution to the literature is its simultaneous assessment of diagnostic efficiency according to referring departments and its association with inflammatory markers. While most previous studies have primarily focused on the demographic characteristics of referred patients or specific disease categories, comparative analyses examining the clinical appropriateness of referrals in conjunction with laboratory parameters remain limited. In the present study, the majority of patients were referred with nonspecific complaints, nevertheless, a rheumatologic diagnosis was established in more than three quarters of cases. The marked differences in diagnostic yield across referring specialties constitute an important finding, highlighting potential variations in the clinical accuracy. In recent years, increasing attention has been directed toward optimizing referral processes in rheumatology practice(9), with growing emphasis on the implementation of structured triage systems and preliminary assessment models(10, 11). The literature indicates that a substantial proportion of referrals to rheumatology clinics are made with inappropriate indications and often without adequate clinical pre-assessment(12). This situation has been shown to prolong waiting times and lead to inefficient utilization of specialist resources(11). This issue is reported to be particularly pronounced in referrals originating from primary healthcare services. In the present study, the significantly lower rate of rheumatologic diagnoses among patients referred from primary care centers is consistent with these observations. In contrast, referrals from internal medicine clinics were associated with higher diagnostic yields as well as more prominent inflammatory markers, suggesting a more effective pre-assessment process in these settings. In the study conducted by Arıcan et al., the rate of rheumatologic diagnosis was reported as 53.1%, whereas this proportion was notably higher at 79.3% in the current study. The inclusion of both inflammatory and non-inflammatory conditions may partly explain the relatively high overall

diagnostic rate. Although joint related complaints represented the most common reason for referral in both studies, the proportion of nonspecific joint pain was 65.3% in the study by Arıcan et al. and increased to 80.2% in the present cohort(13). In a retrospective study conducted by Kutluk et al. in 2025, joint related complaints were reported as the most common reason for referral to rheumatology clinics, with the detection rate of rheumatologic diseases being approximately 30%. In contrast, although the majority of referrals in the present study were similarly based on nonspecific joint pain, the proportion of patients receiving a rheumatologic diagnosis was substantially higher (79.3%). This discrepancy suggests that the profile of referring departments and the effectiveness of pre referral evaluation processes may play a significant role in determining diagnostic yield(3). Importantly, crystal-induced arthropathies constituted 30.2% of all diagnoses in the present cohort and were analyzed separately from other IRD. When crystal-induced arthropathies were excluded, IRD accounted for 60.9% of all rheumatologic diagnoses. When diagnoses were broadly classified, a significant proportion comprised non-inflammatory conditions such as fibromyalgia, osteoarthritis and mechanical pain syndromes, indicating that the high overall diagnostic yield should not be interpreted as reflecting IRD alone. Fibromyalgia is included as a rheumatologic diagnosis in this study, as it is commonly evaluated and managed in rheumatology practice. This approach is consistent with real-world outpatient settings. Numerous studies have demonstrated that triage systems led by rheumatologists improve the appropriateness of referrals to rheumatology services(9). Centers implementing specialist pre-assessment have reported reductions in unnecessary outpatient visits and more efficient allocation of rheumatology care toward high priority patients. Similarly, the use of electronic consultation platforms has been shown to provide significant benefits. Through e-consultation systems, primary care physicians can obtain direct specialist input, allowing for more accurate determination of the need for in person evaluations(14-16). These approaches have been reported to reduce waiting times(17). In the current study, it is noteworthy that only a small proportion of referrals were made with a specific suspicion of a rheumatologic disease. Although diagnostic rates were higher among patients referred with targeted clinical suspicion, the difference did not reach statistical significance. Nevertheless, existing literature suggests that basing referral decisions on structured criteria can substantially enhance diagnostic efficiency(9, 10). Standardization of referral criteria has been particularly recommended to facilitate the timely identification of early inflammatory arthritis. Among alternative triage strategies, musculoskeletal pre-assessment conducted by advanced practice physiotherapists or multidisciplinary teams plays a significant role(18). Systematic reviews have shown that these models are effective in distinguishing mechanical pain from inflammatory conditions and in reducing unnecessary referrals(19). In the present study, the predominance of diagnoses such as mechanical pain syndromes and lumbar disc herniation among patients who did not receive a rheumatologic diagnosis further supports the potential value of such pre screening approaches.

From a broader perspective, international efforts to optimize referral pathways in rheumatology increasingly emphasize structured triage systems and standardized referral criteria(20, 21). Rheumatologist-led triage models and centralized referral systems have been shown to significantly improve referral appropriateness and reduce waiting times(6, 9, 22). In addition, multidisciplinary pre-assessment strategies, including advanced practice physiotherapists, have demonstrated effectiveness as supported by systematic reviews(19). In recent years, digital health solutions and artificial intelligence assisted referral analysis systems have increasingly been incorporated into triage processes. Automated evaluation of referral letters, including prioritization and categorization into potential diagnostic groups, has been shown to enhance the efficiency of referral pathways(23). These systems utilize natural language processing techniques to identify key clinical features within referral notes and to assign cases with suspected inflammatory disease to higher priority categories(24). Algorithm based triage models have been reported to increase appropriate referral rates. Furthermore, the use of these technologies as clinical decision support tools has the potential to promote greater standardization in referral practices(25). Such innovations are considered particularly valuable in high volume centers, where they may contribute substantially to the sustainability of rheumatology services. In addition, predictive modeling approaches integrating clinical and laboratory variables have been proposed to further refine referral prioritization. Although such models were not feasible in the present study due to statistical limitations, the strong association observed

between referral source and diagnostic yield suggests that referral-related variables may play a central role in future predictive frameworks. The role of laboratory biomarkers in the referral process also warrants attention. In the present study, positivity for ANA and ENA was significantly associated with rheumatologic diagnoses, suggesting that these tests may support referral decisions in patients with suspected IRD. In contrast, the widespread use of RF and anti-CCP as screening tools did not improve diagnostic yield. The very high positivity rates observed for RF and anti-CCP likely reflect selective laboratory testing in patients with higher clinical suspicion of IRD, rather than routine testing across the entire referral cohort. Therefore, these findings should be interpreted cautiously, as they may not be representative of the overall referral population and may have introduced laboratory selection bias. This finding aligns with existing literature indicating that laboratory tests applied without appropriate clinical context do not enhance referral quality(12).

Study limitations: This study has several limitations. First, its single-center and retrospective design may restrict the generalizability of the findings. The inability to quantify the number of excluded patients due to incomplete data may have introduced selection bias. This limitation may have influenced the representativeness of the cohort, as patients with more complete clinical documentation and more extensive evaluation may have been preferentially included. Consequently, the overall diagnostic yield observed in the present study may have been overestimated. In addition, the higher diagnostic yield observed among patients referred from internal medicine clinics should be interpreted with caution. This finding is likely influenced by selection bias, as patients evaluated in these settings may undergo more extensive preliminary clinical and laboratory assessment prior to referral. Therefore, the observed difference may reflect more effective pre-selection of patients rather than intrinsically higher diagnostic accuracy. Referral patterns observed in this study may reflect institution-specific clinical practices and healthcare organization, which may limit the external validity of the findings. The relatively high positivity rates of RF and anti-CCP observed in this study may be attributed to selective testing in patients with a higher pre-test probability of IRD, which may have introduced laboratory selection bias. The relatively short duration of the study represents an additional limitation. This may have introduced temporal bias and may not fully capture potential seasonal variations in musculoskeletal complaints and referral patterns. Furthermore, the limited study period may restrict the generalizability of the findings and does not allow for the assessment of long-term trends in referral behavior and diagnostic outcomes. The limited number of patients from some referring departments may also have reduced the statistical power of subgroup comparisons. The lack of adjustment for multiple comparisons may have increased the risk of Type I error. Accordingly, the findings of the present study should be interpreted primarily as exploratory and hypothesis-generating rather than confirmatory. The inability to perform a stable multivariable regression model reflects the strong influence of referral source and the high diagnostic yield in this cohort, which may lead to quasi-complete separation. This finding itself underscores the dominant role of referral patterns in determining diagnostic outcomes. Although Firth's penalized logistic regression was used to reduce the impact of quasi-complete separation, the retrospective single-center design and subgroup imbalance may still limit the robustness of multivariable estimates. Despite these limitations, the findings of this study may provide clinically relevant insights for the development of more efficient referral systems and triage strategies in rheumatology practice, particularly in high-volume outpatient settings.

Conclusion

This study demonstrates that referrals to rheumatology outpatient clinics are largely driven by nonspecific complaints, however, a substantial proportion of patients ultimately receive a rheumatologic diagnosis. The marked differences in diagnostic yield across referring departments indicate that internal medicine clinics, in particular, achieve more accurate patient selection. Higher levels of inflammatory markers among patients referred from internal medicine further support the effectiveness of clinical pre-assessment in these settings. The strong association between ANA and ENA positivity and rheumatologic diagnoses suggests that selective use of laboratory testing may serve as a useful guide in referral decision making. Future multicenter prospective studies are warranted to more clearly define the impact of standardized referral strategies.

Ethics statement: Ethical approval for the study was obtained from the Tekirdağ Namık Kemal University Non-Interventional Clinical Research Ethics Committee (approval date: 24.02.2026 and

approval number: 2026.57.02.29). The study was conducted in accordance with the Declaration of Helsinki. Due to the retrospective design of the study, the requirement for individual informed consent was waived by the ethics committee.

Conflict of interest: None

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Data availability statement: The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

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