



## Five Years' Experience of Multidisciplinary Approach to Chronic Inflammatory Diseases by Rheumatology, Dermatology and Gastroenterology Departments

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### ABSTRACT

**Background** Chronic inflammatory diseases (CIDs) are lifelong complex disorders that affect quality of life, and this study aimed to summarize five years of experience with a multidisciplinary approach for these complex diseases as a result of medical council meetings.

**Material and Methods** Hospital-based, medical records review study was conducted. A total of 45 monthly medical council meetings were held between 2014-2019 with the participation of the rheumatology, dermatology and gastroenterology departments of the same university. Patients with complex conditions that were seen in each department's own polyclinic composed the council. This study only included 308 patients referred by the rheumatology group.

**Results** Females made up 66.5% of the 308 patients. The median age was 45 (19-77) years. Psoriatic arthritis (PsA) and other spondyloarthritis (SPA) patients composed 49.3% of the total. A total of 68.18% of the patients were presented only to consult with the dermatology department. The most common reason for presenting patients was to discuss options for treatment (41.5%). The diagnosis of psoriasis was confirmed in 48 of 67 (71.6%) patients who presented with a pre-diagnosis. The diagnosis was changed in 34.74% of the patients, whereas the diagnosis became completely different in 11.36% of the patients.

**Conclusions** Many patients with challenging diagnosis and treatment processes are encountered in daily practice. The combination of different disciplines makes it possible to provide more rapid and effective solutions. In this study, we aimed to emphasize the increasing importance of such multidisciplinary approaches.

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## Introduction

Chronic inflammatory diseases (CIDs) have a profound effect on populations because CIDs are lifelong diseases, leading to a considerable impact on the quality of life of patients and families.<sup>1,2</sup> Common treatment agents that are used in the management of CIDs, such as psoriasis, psoriatic arthritis (PsA), spondyloarthritis (SPA), rheumatoid arthritis (RA) and inflammatory bowel disease (IBD), suggest a similar pathogenesis and underscore the importance of a multidisciplinary approach.<sup>3</sup>

PsA is a chronic, inflammatory and progressive type of arthritis that affects 10-30% of patients with psoriasis.<sup>4,5</sup> Although dermatologists have sufficient knowledge to identify and treat the cutaneous symptoms of psoriasis, the diagnosis of PsA generally requires specialization in rheumatology.<sup>6</sup> Effective management of PsA should encompass both skin and joint involvement. Early diagnosis is critical since 40-60% of patients exhibit joint damage within the first year of disease onset.<sup>7-9</sup> Therefore, the collaboration of dermatologists and rheumatologists is essential to provide an extensive and holistic approach.

In addition to psoriasis and PsA, skin problems are also among the common extraintestinal manifestations of IBDs. Apart from disease-related skin manifestations, it is also possible to observe paradoxical psoriasis, cutaneous infection, malignancy, and vasculitis.<sup>10</sup> A dermatology perspective is of importance in identifying these lesions.

Recently, we have come to understand that CIDs constitute a systemic inflammatory process associated with important comorbidities, such as diabetes, obesity, nonalcoholic fatty liver disease (NAFLD), coronary artery disease and depression, as a result of our expanding knowledge of biological pathways and epidemiological data.<sup>11-17</sup> These comorbidities, as well as the primary conditions with which they coexist, increase the need for a multidisciplinary approach. A collaboration with gastroenterologists provides advantages in terms of the early diagnosis of comorbidities, such as obesity and NAFLD, and in decreasing the disease burden.

In addition to comorbidities, the increased use

of immunosuppressants has rendered prophylaxis for hepatitis B more important. Moreover, collaboration between gastroenterologists and rheumatologists is essential for the proper management of SPA and IBD.<sup>18</sup>

A collaboration between different departments is also essential in identifying noninflammatory symptoms. In this way, it becomes easier to reduce the clinical and polyclinic patient burden and to provide better quality health care to patients.

In the literature, there are various studies underlining the importance of collaborations between dermatology and rheumatology for PsA and between gastroenterology and rheumatology for IBD. However, to the best of our knowledge, no studies provide data from patient evaluations conducted by three departments holding monthly meetings. This study is important in that the mentioned three disciplines convened to create solutions for challenging cases and shared clinical experiences with each other.

## Material and Methods

### *Study Design*

This is hospital-based, medical records review study. 45 monthly medical council meetings were held between May 2014 and June 2019, with participation of the rheumatology, dermatology and gastroenterology departments of a tertiary university hospital. Two clinicians from rheumatology, two clinicians from dermatology and one clinician from gastroenterology departments took part in the multidisciplinary medical council; during this five-year follow-up period, the same clinicians always joined the council. To perform the present research, the approval was obtained from the Ethics Committee in June 2020 (2011-KAEK-26/332).

### *Data Collection*

Patients with complex problems, such as diagnosis and care issues affecting one of the three departments, who were seen in each department's own polyclinic were chosen for the council. The average number of patients evaluated per session in the council, where all three divisions bring their own challenging cases, was thirteen. This study included only data from the patients who were presented to the multidisciplinary medical council by rheumatology and did not

include the patients presented by gastroenterology and dermatology departments

The patients were evaluated and examined along with their medical histories presented. Demographic and clinical data of the patients as well as the council decisions were recorded in the hospital's information system. The electronic medical records were retrospectively screened for data. Decisions about the diagnosis were grouped as follows: patients whose existing diagnosis was completely changed, patients

who received another diagnosis in addition to the existing one and patients who were undiagnosed before the council meetings and could or could not be diagnosed afterwards. Treatment decisions were classified as the following: patients who had and did not have a change of treatment. Of those who had a change in treatment, patients who were started on biologics for the first time and those who were switched to another biologic were also noted.

**Table 1.** General characteristics of the patients presented to the council (n=308)

Number of councils, n (%)	1	241 (78.25%)
	2	42 (13.64%)
	≥3	25 (8.12%)
Age		
Median (minimum: maximum)		45 (19:77)
Gender, n (%)	Female	205 (66.56%)
	Male	103 (33.44%)
Current diagnosis, n (%)	Psoriatic arthritis	85 (27.60%)
	Other spondyloarthritis	67 (21.75%)
	Rheumatoid arthritis	23 (7.47%)
	Vasculitis	17 (5.52%)
	Connective tissue disease	47 (15.26%)
	Other	37 (12.01%)
	Undiagnosed	32 (10.39%)
Classification according to consultation, n (%)	Gastroenterology only (G)	57 (18.51%)
	Dermatology only (D)	210 (68.18%)
	G+D	41 (13.31%)
Classification by diagnosis and treatment, n (%)	Diagnosis only	99 (32.14%)
	Treatment only	128 (41.5%)
	Diagnosis+Treatment	81 (26.2%)
Coexisting condition, n (%)		72 (23.37%) <sup>†</sup>
	Renal	2 (2.77%)
	Gastrointestinal	48 (66.66%)
	Pregnancy and desire to become pregnant	4 (5.55%) and 2 (2.77%)
	Breastfeeding	2 (2.77%)
	Malignancy	3 (4.16%)
	Other <sup>‡</sup>	16 (22.2%)
Drug side effect		20 (6.49%)
Diagnosis changed, n (%)		107 (34.74%)
Diagnosis completely changed		35 (11.36%)
Diagnosis added		50 (16.23%)
Among the undiagnosed, n (%)		
Diagnosed		22 (7.14%)
Undiagnosed		9 (2.9%)
Change of treatment, n (%)		221 (71.75%)
Started on biologics, n (%)		39 (12.66%)
Switched to another biologics, n (%)		27 (8.76%)

<sup>†</sup>The total number is lower due to the presence of those with both renal and gastrointestinal pathologies.

<sup>‡</sup>Herpes zoster (n=1), pyoderma gangrenosum (n=1), systemic sclerosis digital ulcer (n=1), photocontact dermatitis (n=1), anemia (n=1), allergies (n=2), oral aphthae (n=1), tuberculosis (n=1), thrombophilia (n=1), cervical furuncle (n=1), onychomycosis (n=1), breast fat necrosis (n=1), IgG4-related disease (n=2), hidradenitis suppurativa (n=1).

*Statistical Analysis*

SPSS (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0, Armonk, NY: IBM Corp.) was used for statistical analysis. The distribution of the variables was analyzed with the Kolmogorov-Smirnov test. Descriptive statistics are expressed as the means, standard deviations, medians, ratios and frequency values.

**Results**

Overall, 758 patients were evaluated during 45 meetings held by the multidisciplinary medical council. The rheumatology department presented 308 patients, accounting for 40.6% of all patients. The council evaluated 241 patients once, 42 patients twice, 21 patients three times, and four patients four times, for a total of 404 visits (*Table 1*).

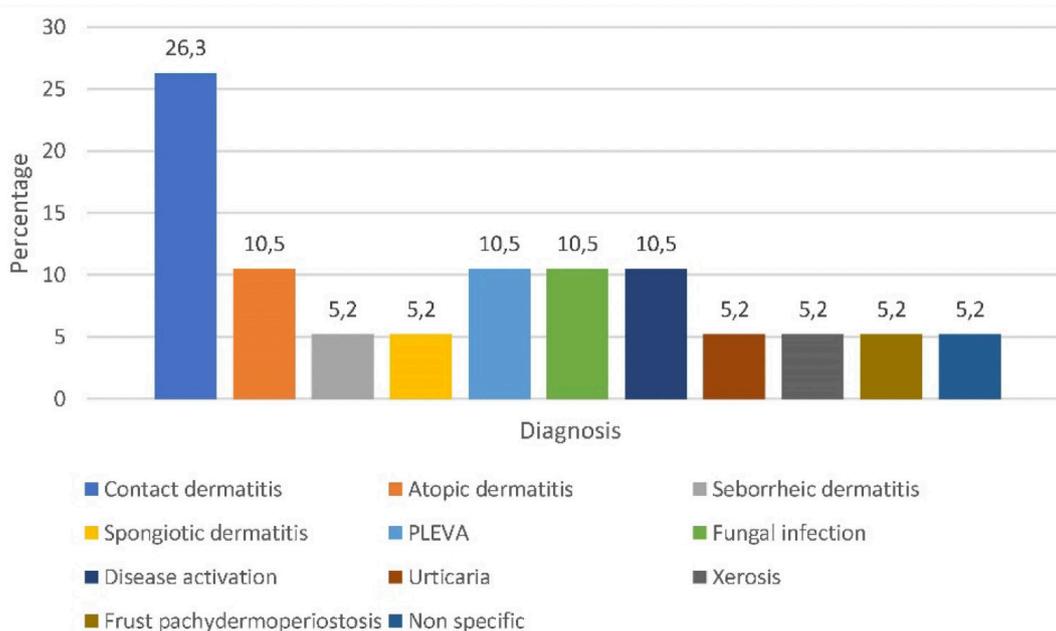
A total of 68.18% of the patients presented to the multidisciplinary medical council only to consult with the dermatology and gastroenterology departments, respectively. 41 (13.31%) patients were presented to consult with both departments, wherein these patients were under follow-up with PsA (n=13), enteropathic arthritis (n=7), ankylosing spondylitis (n=7), Behcet’s syndrome (n=3), IgG4-related disease (n=3), RA (n=1), familial

Mediterranean fever (n=1), antiphospholipid syndrome (n=1) and dermatomyositis (n=1), whereas four patients were undiagnosed. The most common cause of presenting patients to the multidisciplinary medical council was the need for treatment planning (41.55%).

The number of patients who presented to the multidisciplinary medical council with suspected “side effects of medications used” was 20 (6.49%). These side effects consisted of: herpes zoster (n=2), skin infection (n=1), drug rash (n=7), aphthae (n=1), drug-induced diarrhea (n=1), drug-induced lupus (n=1), elevated liver enzymes (n=6) and fulminant hepatitis (n=1).

Psoriasis was considered in 67 of 140 patients (47.85%) who presented to the medical council by rheumatologists with rash and prediagnosis of psoriasis was confirmed by the council in 48 patients (71.64%) (pathological confirmation: 21). Nine (18.75%) of these patients were diagnosed with paradoxical psoriasis. Dermatitis was detected in nine (47.3%) of the remaining 19 patients (*Figure 1*). The total number of patients who underwent a skin biopsy was 73 (52.14%).

After the multidisciplinary council meetings, the diagnosis was completely changed in 11.36% of the patients, which constituted 26.26% of



**Figure 1.** Other diagnosis in patients presented to the multidisciplinary medical council with the preliminary diagnosis of psoriasis.

**Table 1.** NLR values of those operated on according to Bethesda groups

Diagnosis (percentage, %)	Spondyloarthritis	4
	Spondyloarthritis+Behcet's syndrome	1
	Spondyloarthritis+Familial Mediterranean Fever	1
	Psoriatic arthritis	16
	Enteropathic arthritis	4
	Rheumatoid arthritis	3
	Sjogren's syndrome	1
	Mixed connective tissue disease	1
	Undifferentiated arthritis	1
	Discoid lupus	1
	Psoriasis	3
	Granuloma annulare	2
	Hidradenitis suppurativa	1
	Prescribed biologics (percentage, %)	Adalimumab
Etanercept		9
Infliximab		3
Golimumab		1
Ustekinumab		4
Secukinumab		2
Rituximab		3
Tofacitinib		2
Reason for prescription	Disease activation	39
	Disease activation only	32
	+ Inability to use NSAIDs <sup>§</sup> secondary to enteropathic arthritis	3
	+ Side effects of the conventional drugs	4

§NSAID: non-steroidal anti-inflammatory drugs.

those who were presented to the council for problems concerning the diagnosis. Of the 31 patients who were undiagnosed, 22 (7.14%) received a diagnosis. Considering all patients who presented at the multidisciplinary medical council meetings, 2.9% of the patients remained undiagnosed.

In 11 (31.42%) of the 35 patients whose diagnoses were completely changed, noninflammatory diseases replaced inflammatory diseases. Among those, PsA was the most common diagnosis made after the council (48.57%). In the group of patients who received an additional diagnosis, 80 percent were diagnosed with dermatologic diseases, while the remaining 10 patients were diagnosed with PsA, IgG4-related disease, fibromyalgia syndrome, autoimmune hepatitis, AA amyloidosis, gout, primary biliary cirrhosis (PBC), portal hypertension (HT), Crohn's disease, and tuberculosis.

Conventional disease modifying antirheumatic drugs, immunosuppressants and immunoregulatory drugs were added to the treatment regimen in 44 patients (14.28%). The added drugs were as follows: methotrexate (n=21), leflunomide (n=1), hydroxychloroquine (n=5), azathioprine (n=12), cyclosporine (n=2), acitretin (n=2), cyclophosphamide (n=1) and intravenous immunoglobulin (n=1). Before the multidisciplinary medical council meetings, 71 patients (23.05%) were on biologics. 39 patients (12.66%) were started on biologics (Table 2), and 27 patients (8.76%) were switched to another biologic. The causes of switching to another biologic were as follows: paradoxical psoriasis (n=2), switching to rituximab not requiring the use of isoniazid due to elevated liver enzymes (n=2), drug allergies (n=1), need for a different pathway due to change of diagnosis (PsA→Gout and TNFi→IL-1 inhibitor, n=1) and resistance to the prescribed biologic (n=21).

## Discussion

CIDs are lifelong conditions that are challenging to manage, and their management requires a multidisciplinary approach. In such diseases, early and accurate diagnosis as well as effective treatment are highly valuable for increasing treatment success and preventing complications. We evaluated 308 patients with challenging conditions throughout their follow-up between 2014 and 2019 in the mentioned council meetings.

Patients diagnosed with PsA constituted the most frequently presented patient group to the multidisciplinary medical council. Nearly half of patients with PsA exhibit a chronic progressive course.<sup>8</sup> There is evidence suggesting that early intervention provides better outcomes.<sup>19</sup> Effective treatment should be aimed at both skin and joint involvement.<sup>20</sup> The goal here was to prevent this progressive course with a multidisciplinary approach provided by the council.

Rheumatologists' recognition of psoriasis is as important as the recognition of PsA. As a result of the multidisciplinary medical council meetings, psoriasis was accurately identified by rheumatologists in 71.64% of the cases and was most frequently confused with dermatitis (47.3%). In the literature, psoriasis is most frequently confused with seborrheic dermatitis, atopic dermatitis and contact dermatitis in terms of the clinical picture, and biopsy is beneficial for the differential diagnosis.<sup>21,22</sup> A biopsy was performed in 52.14% of the patients who presented to the multidisciplinary medical council for the differential diagnosis of rash, and council meetings were important for determining which patients should undergo biopsy, accurate interpretation of pathology results and rapid diagnosis.

IBD has various extraintestinal manifestations consisting of arthralgia, arthritis, erythema nodosum (EN), pyoderma gangrenosum (PG), primary sclerosing cholangitis (PSC), autoimmune hepatitis, episcleritis and uveitis. Other diseases, such as psoriasis and multiple sclerosis, have also been associated with IBD.<sup>23</sup> Seven patients with enteropathic arthritis presented by us exhibited involvement, such as PG, psoriasis, EN and cutaneous infection. Extraintestinal manifestations are important

indicators of morbidity.<sup>24</sup> Therefore, management of such challenging cases by a multidisciplinary team is ideal instead of evaluation only by gastroenterologists.

Patients with rheumatic diseases are at risk of liver damage due to drug-induced hepatotoxicity, exacerbation of underlying chronic viral hepatitis and possible coexisting liver disease.<sup>25</sup> NAFLD is also common in these patients, with a prevalence of nearly 20%.<sup>26</sup> In our patients, the most common reason for consulting the gastroenterology department was elevated liver enzymes. Diagnoses, such as PBC, PSC, portal HT, autoimmune hepatitis and NAFLD, were made by imaging and biopsies planned by the medical council, wherein the multidisciplinary approach was important for revealing the underlying cause as well as rapid and effective management of the medications used.

In 31.42% of the patients whose diagnoses were completely changed as a result of the council meetings, inflammatory diagnoses for which the patients were followed were replaced with noninflammatory diagnoses. A collaboration between departments is also essential for enabling the recognition of noninflammatory symptoms. Therefore, patients are prevented from receiving unnecessary treatments.

The limitation of this study was that it was a single-center experience and did not include comparisons with other sites that had similar multidisciplinary medical council activities. Such comparisons are challenging, particularly due to the lack of studies combining the three mentioned disciplines. In addition, the absence of patients presented by dermatology and gastroenterology departments is another limitation. However, council meetings revealed the importance of collaboration, especially in the diagnosis and treatment of challenging cases, as well as contributing to the education of subspecialists, assistants and students participating in the council.

## Conclusions

Multiple disciplines may provide a holistic approach to inflammatory diseases by using each other's experience and strategies. Such collaborations reduce disease activity and

morbidity by ensuring a high-quality management process in early diagnosis and treatment. Therefore, such collaborations should be standardized and become more common, particularly in academic centers.

Thus, teams working together at such multidisciplinary medical councils that address challenging cases provide an extensive evaluation of high-risk patients, increase collaboration between departments and provide guidance for accurate diagnosis and effective treatment. The experience gained from this study can set an example for other centers, particularly in terms of enhancing the collaboration between rheumatology, dermatology and gastroenterology departments.

### **Conflict of interest**

The authors declared that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### **Authors' Contribution**

Study Conception: BY, BNC; Study Design: YP, ED; Supervision: BY; Data Collection and/or Processing: TO, AG, SY; Statistical Analysis and/or Data Interpretation: MK, EBB; Literature Review: BY, BNC; Manuscript Preparation: BY; and Critical Review: MK, EBB, YP, ED; Statistics: ACM.

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