



The impact of the ongoing COVID-19 pandemic on the management of rheumatic disease: a national clinician-based survey

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Abstract

This study aims to investigate the impact of the coronavirus disease 2019 (COVID-19) pandemic on the management of rheumatic diseases (RD). An online survey included 10 questions were designed to assess potential differences in rheumatology practice. The survey was conducted between March 2021 and June 2021. Marginal homogeneity test was used to compare frequencies of outpatient clinic patients between the pre-pandemic and pandemic. Other results were analyzed by descriptive statistics. One hundred three clinicians (75.7% in rheumatology practice for at least five years) responded to the survey. Almost 70% examined < 30 patients per day during the pandemic while nearly 70% examined ≥ 30 patients per day before the pandemic ($p < 0.001$). They indicated following reasons for decreasing outpatient clinic activity were concerns regarding COVID-19 transmission risk of the patients (95%) and the clinicians (53%), being able to supply chronic medications directly from the pharmacy (85%), lockdown (71%), limited outpatient appointments (64%) and using telemedicine (20%). The frequencies of rheumatology daily routine procedures were decreased as follows; patient hospitalization for diagnosing (80%) and treatment (78%), labial salivary gland biopsy (63%), Schirmer's test/salivary flow rate test (56%), nail bed video-capillaroscopy (52%), musculoskeletal ultrasonography (51%) and Pathergy test (50%). Clinicians hesitated to use rituximab (63%) mostly, followed by cyclophosphamide (53%), glucocorticoids (43%), tofacitinib (41%), mycophenolate mofetil (36%), and azathioprine (33%). In this first national survey, the prominent differences in the management of RD have decreased outpatient clinic activity, reduced rheumatology daily procedures, and hesitancy to use some rheumatic drugs.

Keywords COVID-19 · Pandemic · Rheumatic disease · Rheumatology practice · Survey

Introduction

Coronavirus disease 2019 (COVID-19) is a condition caused by the severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) [1]. The disease was declared a pandemic by the World Health Organization on March 11, 2020, affected billions of people worldwide until now and is still in progress.

Patients with rheumatic diseases (RD) could be immunocompromised due to high disease activity, pharmacological therapies, and comorbidities [2]. Compromised immune system could make them more susceptible to infections

[2]. Early on the COVID-19 pandemic, clinicians and their patients were in a challenge because of early literature data including increased severity and mortality in patients with underlying chronic medical conditions [3, 4]. Then global registry reports showed that COVID-19-related poor outcomes in patients with RD were associated with general factors (older age, male sex, and specific comorbidities) and disease-specific factors (high disease activity and specific medications) [5, 6]. They also reported that the patients using moderate to high dose glucocorticoids and some immunosuppressant (especially rituximab), had a higher risk for COVID-19 [5, 6].

Several recommendations which were about the management of RD in the COVID-19 pandemic were developed by the international rheumatology societies [7–9]. These guidelines generally recommended that patients with RD on standing immunosuppressive medications should be maintained on their therapy and only withhold the medications if they contact COVID-19 infection [7–9]. In addition, to

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prevent the spread of COVID-19, all countries have taken some precautions such as lockdown, social distancing, mandatory use of protective masks, etc. All these literature and public regulations had led to differences in rheumatology practice depending on time.

To date, some studies were reported about the change of rheumatology practice in clinicians during the early pandemic [10–18]. To our knowledge, as of the first anniversary of the pandemic, changes in the rheumatology practice point of view of the clinician have not previously been reported in any countries. This survey study aimed to identify differences in clinicians' practice about the management of RD during the pandemic in Turkey.

Methods

Survey design

This survey study was conducted by rheumatologists from the Division of Rheumatology at Ankara University. An online survey was directed to clinicians working on RD to collect information about identifying their perspective in diagnosis, treatment, and follow-up of RD in the COVID-19 pandemic. Ethical approval of this survey was provided by the Ankara University Ethics Committee (Protocol number: I2-172-21; Date: 04.03.2021).

The survey included two sections with 10 closed-ended questions (one-choice, multiple-choice, and 5-point Likert scale questions) and open-ended questions about unmet needs. The first section was designed to assess respondent characteristics including age, sex, institutions, specialty, and years in rheumatology practice (5 questions). The second section was designed to determine differences in clinicians' practices between the pre-pandemic and pandemic periods (5 questions). The first three questions were about the outpatient clinic activity during the pandemic and pre-pandemic, the reasons for low outpatient clinic visits. The last two questions were about the usage of rheumatology daily routines and choosing of rheumatic drugs, designed with a 5-point Likert scale ranging from very less than pre-pandemic period to much more than pre-pandemic period (Supplementary File 1).

Survey validation, dissemination and data collection

The online survey was published on <https://forms.gle/YPpH4cacDkCNEkJh6> using Google Forms. It was designed in Turkish, following the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) guidelines [19]. Also, another recently published guideline for survey-based studies was used while the survey was reported [20]. The

pilot test of the survey was tested by 20 respondents. After the pilot test, face and content validation was performed by the independent clinicians including two consultant rheumatologist and one fellow in rheumatology. The final version was accepted after the review of all co-researchers. It was completed in almost 10 min.

The survey included a cover letter providing the aim of the study, the research team, response time, and how to fill in the survey. Clinicians working in RD were invited to complete the survey by e-mail including a Google Form link. In March 2021, the survey was sent to members of the Turkish League Against Rheumatism via e-mail. It was also sent to clinicians via social media (Facebook, WhatsApp). The survey was sent again at certain intervals until June 2021 as a reminder. Total 103 clinicians responded to the survey voluntarily and anonymously.

Statistical analysis

Marginal homogeneity test was used to compare the frequency of outpatient clinic patient between the pre-pandemic and pandemic. The significance level was set at $p < 0.001$. Other results were analyzed by descriptive statistics. Descriptive statistics were reported in the form of number and percentages. All analyses were done using the SPSS 22.0 program®.

Results

Characteristics of clinicians

103 clinicians (F: M ratio 1.14) responded to the survey. Around 70% of clinicians were ≥ 31 years of age and 75.7% of them had been in rheumatology practice for at least 5 years. Most respondents were physical medicine and rehabilitation (PM&R) specialists (58.3%) and rheumatologists (40.8%). Almost 90% of clinicians worked at university (59.2%) and state (31.1%) hospital (Table 1).

Impact on outpatient clinic control

Before the COVID-19 pandemic, nearly 70% of respondents examined an average of ≥ 30 patients per day. In contrast, slightly more than 70% of the respondents examined an average of < 30 patients per day during the pandemic. This difference was statistically significant ($p < 0.001$) (Fig. 1).

The respondents indicated that patients attended to less visits during the pandemic because of various reasons, including patient's concern for COVID-19 transmission (98, 95%), being able to supply chronic medications directly from the pharmacy (88, 85%), lockdown (74, 71%), reduced number of daily outpatient appointments (66, 64%), clinician's

Table 1 Survey respondent characteristics

Characteristics	Clinicians (103) N (%)
Age group	
20–30 years	29 (28.2)
31–40 years	38 (36.9)
41–50 years	21 (20.4)
51–64 years	12 (11.7)
≥ 65 years	3 (2.9)
Gender	
Male	48 (46.6)
Female	55 (53.4)
Institution	
University hospital	61 (59.2)
State hospital	32 (31.1)
Private hospital	7 (6.8)
Private practice	3 (2.9)
Specialty	
PM&R	60 (58.3)
Rheumatology	42 (40.8)
Internal medicine	1 (0.9)
Years in rheumatology practice	
< 5	25 (24.3)
5–9	33 (32.0)
10–19	23 (22.3)
≥ 20	22 (21.4)

PM&R physical medicine and rehabilitation

concern for COVID-19 transmission (55, 53%), and using telemedicine (21, 20%) (Fig. 2).

Impact on rheumatology daily routines

Among the respondents, about 80% mentioned that decreased patient hospitalization for diagnosing and treatment during the pandemic. Although some of the respondents spent less time on physical examination (40%) and anamnesis (23%), some of them spent more (30%; 20%, respectively) (Fig. 3).

More than half of the respondents decreased some procedures to maintain social distancing compared to the pre-pandemic period. These procedures were labial salivary gland biopsy (53/83, 63%), Schirmer's test/salivary flow rate test (47/84, 56%), nail bed video-capillaroscopy (40/76, 52%), musculoskeletal ultrasonography (50/98, 51%), and Pathergy test (42/84, 50%) in Fig. 3.

The respondents indicated that patients had been analyzed by the diagnostic tests after telemedicine more than face-to-face examination (laboratory test 27% vs 6%; X-ray 14% vs 5%; computed tomography (CT) 12% vs 7%; magnetic

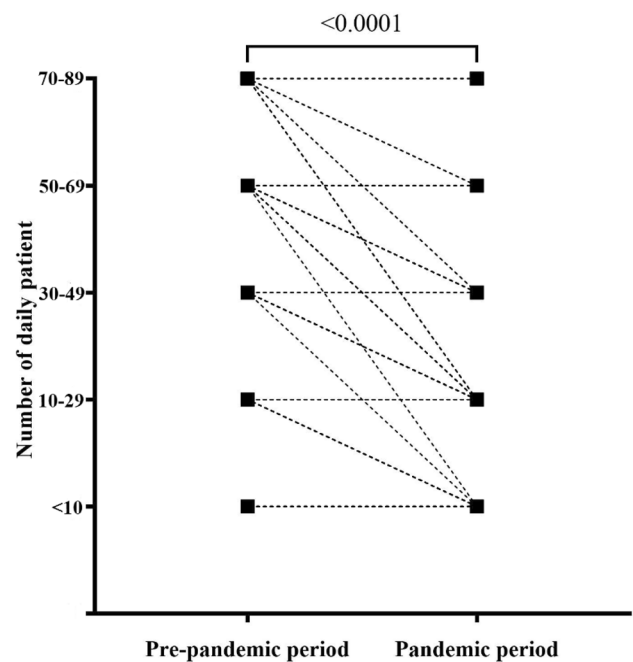


Fig. 1 Frequency of outpatient clinic patient during the pre-pandemic and pandemic period. Questions: How many patients did you examine in the outpatient clinic per day during the pre-pandemic/pandemic period? *p* statistically significance level in marginal homogeneity test

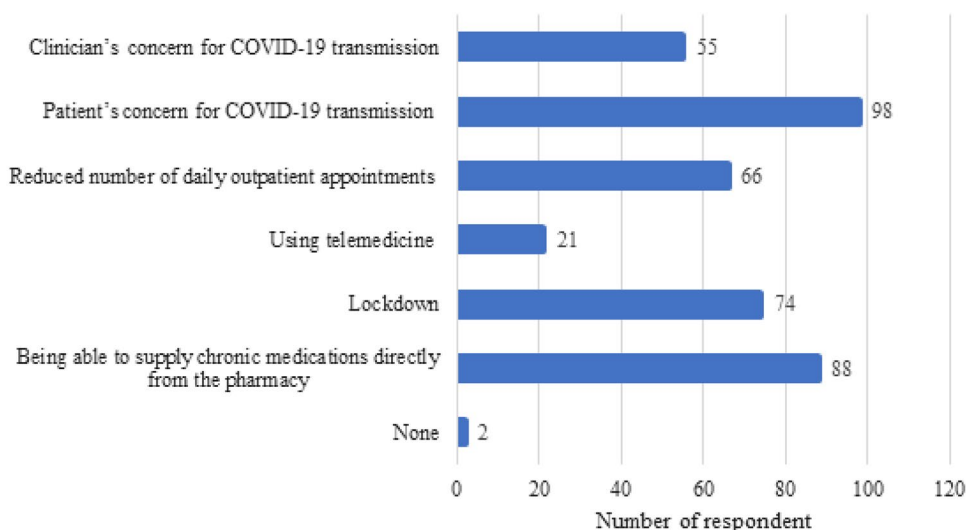
resonance imaging (MRI) 15% vs 7%, respectively) during the pandemic (Fig. 3).

Impact on medical therapy use

During the pandemic, nonsteroidal anti-inflammatory drugs (NSAIDs) and conventional synthetic disease-modifying anti-rheumatic drugs (csDMARDs) were preferred less by about one-five of clinicians. Contrary, NSAIDs (11%), hydroxychloroquine (HCQ) (19%), and colchicine (5%) were preferred more by some clinicians. Around 40% of respondents indicated that they preferred glucocorticoids (GCs) and immunosuppressants (IS) less. The least preferred was cyclophosphamide (53%). Also, 9% of respondents preferred GCs more during the pandemic (Fig. 4).

Almost half of the respondents mentioned that they hesitated to use biologic DMARDs (bDMARDs) and tofacitinib, mostly rituximab (63%). During the pandemic, some of the clinicians reported using low molecular weight heparins (LMWH) (20%), acetylsalicylic acid (ASA) (10%), warfarin (5%) more than the pre-pandemic period. Most of the respondents did not change using vasodilators [calcium channel blockers (CCB), phosphodiesterase type 5 inhibitors (PD5I), endothelin receptor antagonists (ERA), prostanoids]. Further, about 20% of respondents preferred intravenous immunoglobulin (IVIG) and plasma exchange (PEX) less (Fig. 4).

Fig. 2 Reasons for decreased outpatient clinic activity in patients with the rheumatic disease during the pandemic period



Discussion

In this survey, we observed a reduced frequency of outpatient visits due to the risk of COVID-19 transmission and public regulations during the pandemic. We also found a decrease in the frequency of rheumatology routine procedures. In addition, we observed that clinicians mostly differed in their overall management of medications compared to the pre-pandemic period.

Outpatient clinic activity

This study indicated that outpatient clinic activity was decreased during the COVID-19 pandemic. Similarly, other studies reported that rheumatology departments were functioning less than 50% capacity [13] with a 65% decrease in the outpatient clinic activities [15] during the pandemic. Concerns of patients and clinicians regarding COVID-19 transmission risk was a common reason for decreasing outpatient clinic activity. Other reasons were new public regulations such as supplying medicine from the pharmacy directly, lockdown, and reducing the number of daily outpatient appointments. Ziade et al. showed that the negative impact on rheumatology visits was associated with personal infection with SARS-CoV-2, patient with COVID-19 death, isolation due to COVID-19, and impact on mental health [14, 15].

During the pandemic, the number of daily patients in outpatient clinics reduced apparently. Likewise, previous studies mentioned a decrease in hospitalizations and physical examinations during the pandemic [10, 15]. However, time per patient on physical examination decreased in 40% of respondents, increased in 30% of respondents. In 40% of them, the physical examination duration for a patient may be reduced to prevent the risk of COVID-19 transmission.

In 30% of them, the decrease in the number of daily patients might have led to an increase in time per patient.

In this study, medical procedures (labial salivary gland biopsy, Schirmer's test, salivary flow rate test, nail bed video-capillaroscopy, musculoskeletal ultrasonography, and Pathergy test) in which social distance cannot be maintained, were preferred less by clinicians. Therefore, underuse of these procedures may lead to an underestimate/underdiagnose of RD during the pandemic.

This survey also showed that telemedicine was another reason for reducing face-to-face visits. Telemedicine had been rarely used in rheumatology before the pandemic [21]. However, during the pandemic, it was widely used in patients with RD [13–15, 22, 23]. While using telemedicine provided to minimize viral transmission, it might be limited in some medical procedures as physical examination. As a result of that, in this study clinicians investigated their patients with the diagnostic tests after telemedicine more than face-to-face examination.

Drug use

In this study, almost 70% of respondents preferred NSAID similar to the pre-pandemic period. Early in the pandemic, it has been reported case-wise that using NSAID in patients with COVID-19 may be associated with poor outcomes [24]. Further data suggested that NSAID was not associated with an increased rate of hospitalization in COVID-19 patients with RD [12]. In our survey, 81% of respondents did not decrease NSAID use while only 19% of respondents used NSAID less. Contrary, in some early survey studies, the respondents stated that they were concerned about NSAID use and were recommending to their patients to decrease or avoid NSAID [12, 16]. Today, recent guidelines stated

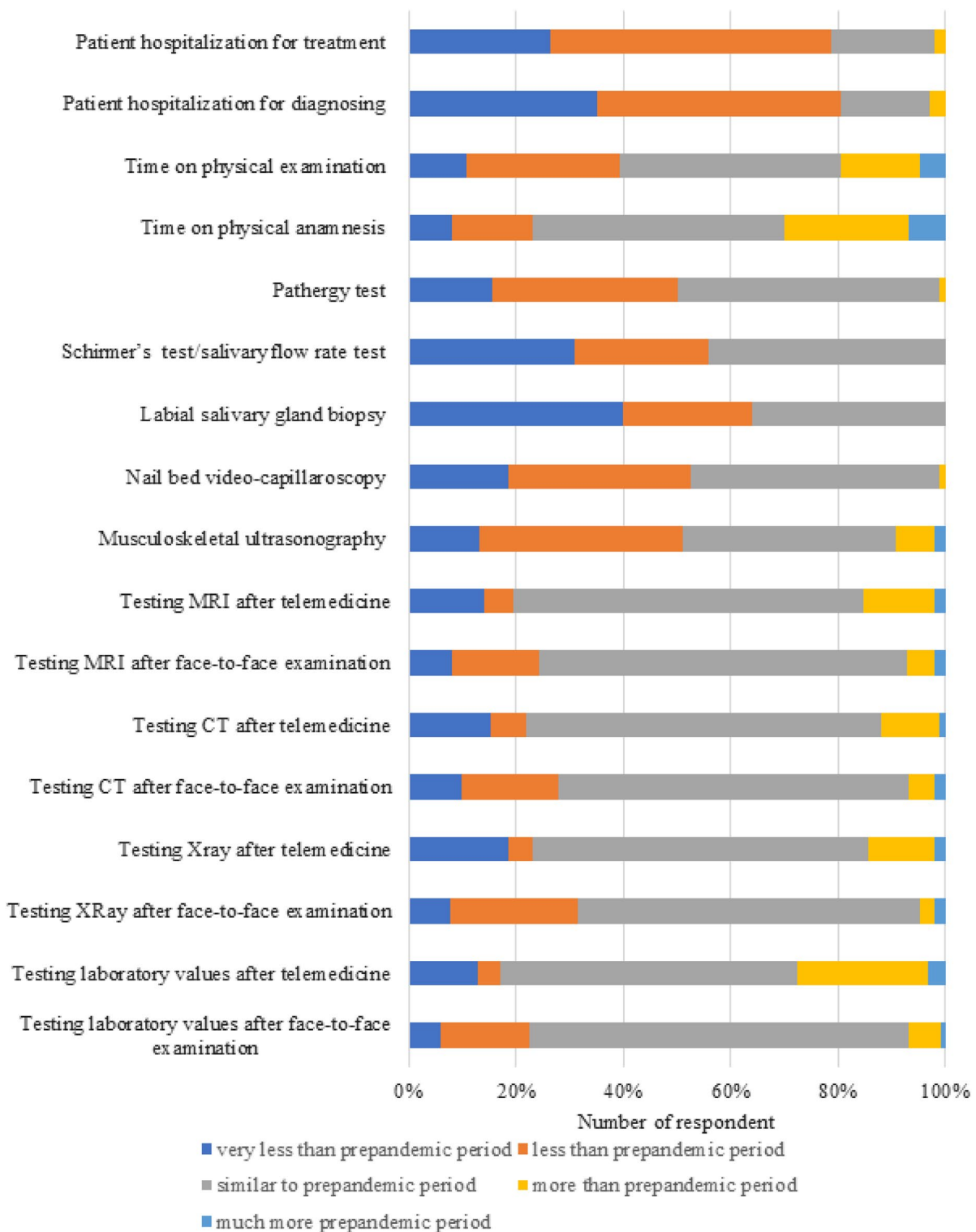


Fig. 3 Frequency of rheumatology routines during the pandemic period. *CT* computed tomography; *MRI* magnetic resonance imaging

that NSAID might be used in patients with RD during the pandemic when indicated [8, 9].

Glucocorticoids were less used by around 40% of respondents in this survey. Based on the Global

Rheumatology Alliance registry data, prednisone equivalent doses ≥ 10 mg/day were associated with higher hospitalization in patients with RD [5, 25]. Previous survey studies which were published in the early stages of the pandemic

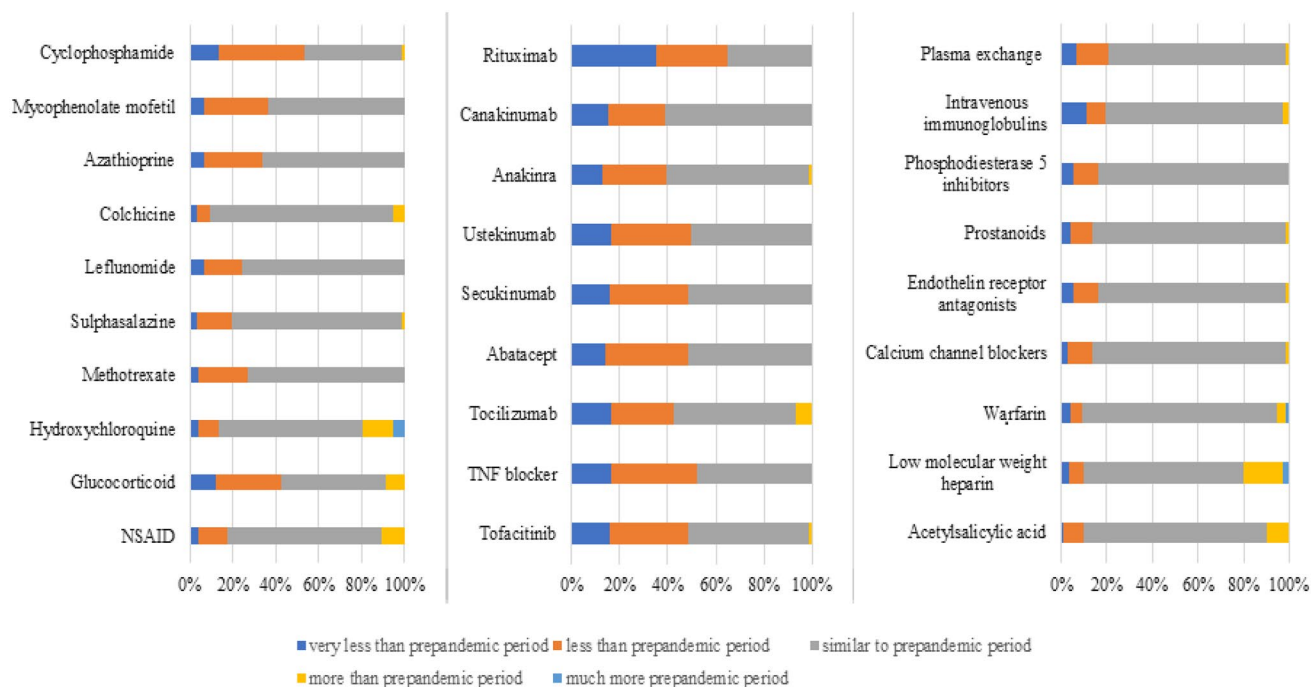


Fig. 4 Frequency of medical therapy used during the pandemic period. Question: How often do you use these medical therapies during the pandemic period compared to the pre-pandemic period?. *NSAID* nonsteroidal anti-inflammatory drugs; *TNF* tumor necrose factor

reported that an earlier or faster tapering of glucocorticoids was preferred by almost half of clinicians [11, 16]. Another survey demonstrated 56% of rheumatologists reduced the use/dosage/frequency of steroids [12].

Immunosuppressants, bDMARDs and tofacitinib were less used by almost 40% of respondents. Clinicians hesitated to use rituximab (63%) mostly, followed by cyclophosphamide (53%). Early in the pandemic, Gupta et al. reported that almost half reduced the usage of bDMARDs, with 58.3% deferring rituximab, followed closely by cyclophosphamide, tumor necrose factor blockers, janus kinase (JAK) inhibitors, and other bDMARDs [11]. Batu et al. also showed pediatric rheumatologists hesitated to initiate cyclophosphamide, rituximab, GCs, respectively [16]. In addition, other studies presented that some clinicians avoided starting new biologics [10], stopped intravenous biologics during the peak of the pandemic [13].

In July 2021 (online 27 January 2021), a new Global Rheumatology Alliance registry data showed that rituximab, sulfasalazine, immunosuppressants (azathioprine, cyclophosphamide, ciclosporin, mycophenolate, or tacrolimus) were associated with higher odds of death [6]. This registry also showed that other synthetic/biological DMARDs were not associated with COVID-19-related death [6]. The other national cohort study from Sweden found a modest (20%–30%) risk of hospitalization and death-related COVID-19 in patients with RD using rituximab and JAK inhibitors [26]. Recently, national Veterans Affairs Data did not find

a significant association between rheumatic drugs and hospitalization or death except glucocorticoids [27]. Although our survey was conducted between March and June 2021, some clinicians still hesitated all bDMARD. Hence, we may express that the incompatible results of different studies are not directly and simultaneously reflected in the practice of rheumatology.

On the other hand, some rheumatic drugs were used for the treatment of COVID-19. Early in the pandemic, HCQ was widely preferred in the world. For that reason, patients with RD fell into a shortage of HCQ [16]. Then, it was not recommended because of increased cardiovascular risk and no significant effect in randomize controlled trials (RCTs) [28, 29]. Other drugs such as colchicine, tocilizumab, anakinra, baricitinib, and IVIG were preferred in the treatment of selected COVID-19 patients [30]. Further, anti-coagulation/platelet therapy was a part of severe COVID-19 treatment [31]. In our survey, depending on all these therapeutic approaches in the COVID-19, some clinicians may prefer these drugs more in rheumatic indications.

The main limitation of this study was that the results of the study were time sensitive. These results described clinician practices one year after the pandemic while many other clinician-based surveys were published in the early stages of the pandemic. Rapidly changing scientific data including the relation between COVID-19 and RD, lead to important effects on rheumatology practice. Another limitation of the study was a relatively limited respondent number.

The respondents might be less willing to respond to the survey because they faced numerous online surveys during the pandemic period. The last limitation of the study was the Delphi process for preparing survey questions and test–retest validation of the survey could not be performed due to the COVID-19 burden. On the other hand, the main strengths of the study were that it was conducted on the first anniversary of the pandemic unlike early pandemic surveys, and it was the first national study in Turkey.

Conclusion

This study demonstrated that the COVID-19 pandemic largely affected the management of RD. On the first anniversary of the pandemic, we found that decreasing outpatient clinic activity and reducing the use of all rheumatology routine procedures were still ongoing. In addition, the clinicians' concerns about the usage of rheumatic drugs that were more common in the early part of the pandemic, had been partially resolved with new publications (guidelines, RCTs, etc.). However, these concerns have not yet been fully eliminated.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s00296-022-05102-7>.

Author contributions All authors contributed to the study conception and design. Material preparation, data collection, and analysis was performed by KA, GA, GN. The first draft of the manuscript was written by KA. All authors commented on previous versions of the manuscript. All co-authors read and approved the final manuscript.

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Declarations

Conflict of interest All authors have no conflict of interest.

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