# Evaluation of patients with rheumatoid arthritis in teleconsultation during the first wave of the COVID-19 pandemic

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**Abstract**

**Objective:** To describe which parameters were collected by rheumatologists to monitor patients with rheumatoid arthritis (RA) during teleconsultation and identify which ones have more impact on clinician intervention.

**Methods:** Retrospective monocentric routine care cross-sectional study including RA patients seen in teleconsultation between March and September 2020. Available parameters assessing disease status were collected in teleconsultation files. Clinician intervention was defined by treatment escalation and/or the need for a rapid face-to-face consultation or day hospitalization.

**Results:** 143 RA patients were included (117 females, mean age of 58±16 years, mean disease duration of 14±11 years). The presence or absence of patient self-reported RA flares was mentioned in all medical files, followed by the presence and/or the number of tender joints (76%), the duration of morning stiffness (66%), the number of pain-related nocturnal awakenings (66%) and the CRP value (54%). Teleconsultation led to a clinician intervention in 22/143 patients (14%), representing 51% of patients with self-reported flares (22/43 patients). Therapeutic escalation was necessary in 13 patients and/or face-to-face consultation or day hospitalization were organized for 10 patients. Multivariate analysis identified RA flares (Odds Ratio, OR: 15.6 95% CI 3.37-68.28) and CRP values >10 mg/L (OR: 3.32, 95% CI % 1.12-13.27) as the variables independently associated with clinician intervention.

**Conclusion:** Our study identified patient reported RA flares and increased CRP values as 2 red flags in teleconsultation, independently associated with therapeutic modification and/or the need for a rapid face-to-face consultation. These indicators may help clinician's decision making in teleconsultation.

## Introduction

The sudden emergence of SARS-CoV-2 onto the world stage, and the high morbidity and mortality associated with COVID-19 symptoms in a proportion of those infected, has accelerated a major change in the management of patients with chronic rheumatic diseases and has catalyzed the rapid emergence of telemedicine. Indeed, remote appointments have largely replaced face-to-face consultations during the first wave of the pandemic [1]. Although important to reducing viral spread, they have been implemented rapidly, despite clinicians/patients having limited remote consultation experience [2]. Thus, this rush to telemedicine prevented the possibility to reach a consensus in the use of existing tools to ensure standardized teleconsultation, leading to huge heterogeneities in telemedicine practices in Europe and within countries.

While facing the COVID-19 pandemic, rheumatologists stratified the risk of infection in people with rheumatoid arthritis (RA) according to their treatment regimen, age, and comorbidities [3, 4] and many were advised not to come to hospitals and outpatient clinics because of an increased risk of infection. On the other hand, the importance of maintaining tight control of inflammation has been emphasized, both in order to prevent the risks of inadequately treated RA for the disease itself but also because poorly controlled disease has been reported to be an independent risk factor for serious infections [3]. The main challenge in this setting was the possibility for clinicians to perform an accurate assessment of disease activity allowing the application of a treat-to-target strategy during a teleconsultation, where the clinical evaluation of tender joints and swollen joints was precluded. Dealing with the absence of clinical examination can be challenging, as these objective parameters are pillars for the calculation of composite indices such as the disease activity score (DAS)-28. Incorrect disease assessment may have potential harmful consequences, including ignoring disease flares, or conversely,

misguidedly suspecting disease progression in patients in remission or low disease activity but in whom certain subjective symptoms persist, such as pain, fatigue, or loss of physical function. Two observational studies and 2 randomized controlled trials have previously assessed the effectiveness of telemedicine on disease activity outcome among established RA patients [5-8]. Telemedicine was found as noninferior to face-to-face visits in terms of disease activity and function. No study reported worse outcome among patients who received telemedicine. It is important to note that these studies were all conducted in the pre-COVID-19 era by physicians trained for telemedicine, in selected patient populations [9]. These conditions markedly differ from the situation during the pandemic, in which physicians were not experienced or trained to telemedicine due the brutality of the health crisis. Thus, it is important to gather data reflecting this situation, obtained in clinical practice and real-life conditions of teleconsultations.

Thus, our objective was to describe which parameters were most frequently used by rheumatologists to monitor RA in teleconsultation during the first wave of the pandemic and identify the ones that more frequently led to a change in disease management.

## Patients and Methods

**Study design:** A retrospective monocentric routine care cross-sectional study was conducted between March and September 2020 in the Rheumatology department of Cochin Hospital.

**Study Population:** We included all patients >18 years of age with the diagnosis of RA according to the rheumatologist, seen in teleconsultation by phone or video consultations. These patients had a scheduled face to face appointment that was turned onto a teleconsultation because of the first wave of the pandemic.

All included patients agreed to participate in the study after written informed consent, which was recorded in the medical source file. The protocol and the informed consent document have

received Institutional Review Board/Independent Ethics Committee (IRB/IEC) approval before initiation of the study ("Comité de Protection des Personnes" Ouest VI, n°202-A02933-36).

**Intervention:** Teleconsultations were performed by telephone or video consultation by 8 different physicians (**Table S1**). These two modalities were fully available from the onset of the pandemic. The choice of the modality was let to the discretion of the physician.

**Data collection:** Data were obtained after the review of the electronic medical report (EMR). Eight different physicians were involved in this study and entered data of the teleconsultation in the EMR. For all teleconsultations, we collected demographic data, disease characteristics (disease duration, antibody status, presence of erosive disease), ongoing RA therapy and all available parameters assessing disease status. No consensus among clinicians was decided in advance regarding the nature of data to capture of the switch to telemedicine. We retrospectively collected the following items of interest: patient self-reported RA flares, defined as worsening of RA accompanied by at least one swollen and tender joint, as perceived by the patient [10], tender joints (presence or number of patient-reported tender joints), swollen joints (presence or number of patient-reported tender joints), pain visual analogic scale (VAS), VAS for fatigue, patient global VAS, pain-related night awakenings, morning stiffness, values of erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP), the disease activity disease activity score (DAS)-28 calculated by replacing provider swollen and tender joint counts with patient-reported swollen and tender joint counts [11, 12], and treatment tolerability.

**Outcomes:** The first endpoint of the study was to describe which parameters assessing RA were recorded during the teleconsultation. The second endpoint was to identify the parameters that more frequently led to a change in disease management. To this end, we assessed which

parameters were associated with clinician intervention. We defined clinician intervention by treatment escalation (introduction or increase in corticosteroids, introduction or increased in conventional synthetic or targeted disease-modifying anti-rheumatic drugs, DMARDs) and/or the need for a rapid face-to-face consultation or day hospitalization to assess disease activity.

**Statistical analysis:** All data were expressed as mean values ± standard deviation (SD) or median (range), unless stated otherwise. Statistical analysis was performed using using Medcalc (v18.9.1). The chi-square test was used to seek for differences in frequency. Multivariate analyses by logistic regression were also performed to determine the factors independently associated with clinician intervention. This analysis included the clinician intervention in teleconsultation as the dependent variable. All relevant identified covariates with a *P* value <0.1 in the single variable analysis were then entered in one single step in each model. Odds ratio (OR) and 95% confidence intervals (CI) were then calculated. In this model, a *P* value <0.05 was considered statistically significant.

## Results

### Study population

A total of 143 patients (116 females, 81%) with established RA were included, with a mean age of 58±16 years and a mean disease duration of 14±11 years. Positive rheumatoid factors or anti-CCP antibodies were reported in 100/139 (72%) and 104/139 (75%) patients, respectively. Erosions were present in 75/140 (54%) patients. Detailed characteristics of our study sample are provided in **Table 1.** Teleconsultation was performed by telephone for 106 patients (74%) and by video consultation for 37 patients (26%). Disease characteristics were similar between patients evaluated by telephone or video consultation (**Table 1**), except a trend for higher

teleconsultations performed by telephone in patients with a low socioeconomic status (23% vs. 11%, p=0.11).

**Individual data collected during the teleconsultation**

The different data collected during the teleconsultation are presented in **Table 2**. The most frequently reported items (>50%) were the presence or absence of patient self-reported RA flares since the last visit (n=143, 100%), the presence and/or the number of tender joints (n=109, 76%), the duration of morning stiffness (n=95, 66%), the number of pain-related nocturnal awakenings (n=95, 66%) and the CRP value (n=77, 54%). Treatment tolerability was reported for 63 patients (44%). Several differences were observed according to age, gender, and socioeconomic status: the presence and/or number of pain-related nocturnal awakenings were less reported in patients with age >65 years (55% vs. 73% in patients aged ≤65 years, p=0.028) and males (48% vs. 71% in females, p=0.029); CRP value, patient global evaluation and the DAS-28 were less reported in patients with low socioeconomic status (39% vs. 59%, p=0.060, 29% vs. 56%, p=0.012 and 11% vs. 31%, p=0.035, respectively) (**Table 2**).

**Value of patient-reported RA flare in teleconsultation**

Patient self-reported RA flares concerned 43/143 patients (30%). The presence of self-reported RA flares was associated with a more detailed evaluation of patient in teleconsultation: The presence (or number) of tender joints and swollen joints were more significantly reported in patients who presented a flare (39/43, 91% vs. 70/100, 70%, p=0.008 and 25/43, 58% vs. 23/100, 23%, p<0.001, respectively). A trend for a higher reporting of the number of nocturnal awakenings in patients with a flare was also observed (33/43, 77% vs. 62/100, 62%, p=0.080). In addition, presence of a flare was associated with a clinician intervention during the teleconsultation (18/22, 82% vs. 25/121, 21%, p<0.001). Of note, only a single patient

experienced COVID-19 and had temporally interrupted methotrexate, without occurrence of disease flare. No patient permanently interrupted their treatment because of side effect, COVID-19, or persistent remission.

**Individual data associated with clinician intervention**

Among all 143 teleconsultations, a clinician intervention was necessary in 22 patients (15%). Therapeutic escalation was proposed to 13 patients (introduction or dose increase of corticosteroids in 8 patients, introduction or dose increase of methotrexate in 4 patients and introduction of hydroxychloroquine in 1 patient) and face-to-face consultation or day hospitalization for early disease assessment was proposed to 10 patients.

Patients requesting clinical intervention had a shorter disease duration (10±10 years vs. 15±11 years, p=0.049), a lower frequency of erosions (19% vs. 60%, p<0.001), a more active disease, and a higher likelihood of corticosteroid therapy (73% vs. 42%, p=0.007) (**Table 4**).

The following variables were associated with clinician intervention during the teleconsultation in univariate analysis (**Table 5)**: patient self-reported RA flares since the last visit (p<0.001), CRP >10 mg/mL (p=0.003) and a morning stiffness > 30 minutes (p<0.001). After multivariate analysis by logistic regression, RA flares (Odds Ratio, OR: 15.6 95% CI 3.37-68.28) and CRP values >10 mg/L (OR: 3.32, 95% CI % 1.12-13.27) were the single variables independently associated with clinician intervention (**Table 5**).

**Outcome of patients requesting a face-to-face consultation**

A face-to-face consultation or day hospitalization for early disease assessment was proposed to 10 patients who all experienced self-reported RA flares and 4 had CRP levels > 10 mg/L. Active disease was confirmed during this next face-to-face visit in 9 patients, with DAS28 ranging from 3.35 to 5.62, leading to therapeutic modification (**Table 3**).

The 133 other patients were seen in face-to-face consultation 6±2 months after the teleconsultation. No DMARD modification was recorded during this next face-to-face consultation, particularly in the 22 patients who reported a flare that did not lead to a clinician intervention during the previous teleconsultation.

**Discussion**

COVID-19 pandemic had important consequences on decisions for the management of people with inflammatory chronic rheumatic disorders. A recent survey among EULAR countries showed that measures related to containment of COVID-19 pandemic led to a perceived delay between symptom onset and a first rheumatological visit, postponement of treatment decisions, and shortage of hydroxychloroquine and tocilizumab, thereby negatively impacting early treatment and treat-to-target strategies [13]. Another study performed in Latin America revealed that patients with inflammatory rheumatic diseases were negatively affected by the COVID-19 pandemic, characterized by an increase in self-rated disease activity, a reduction in medication adherence, and hurdles for medical follow-up [14]. To ensure a continuous care of these patients, teleconsultation may represent a valid alternative to in-person visits during the pandemic. During early days of the pandemic, DMARD interruptions were associated with an absence of telemedicine availability [15]. The issue is to conduct efficient teleconsultations to continue to achieve optimum disease control. However, the abrupt transition from in-person visits to telemedicine during the first wave of the pandemic did not permit to adequately work on relevant parameters to measure disease activity in teleconsultation.

A critical issue of teleconsultation is the reliability of the clinician decision and intervention to identify patients that require early face-to-face reviews and/or therapeutic adjustments because of an insufficient disease control. Importantly, the decision taken during the teleconsultation was mostly confirmed during the next face-to-face visit in 9 of the 10 patients with early disease

assessment and in all the 133 seen in routine 6±2 months later; highlighting the accuracy of the teleconsultation-driven clinical intervention. The phase of the disease may be an important consideration in determining the appropriateness of telemedicine. Indeed, it was reported that clinicians prefer teleconsultations for established patients and our study population had longstanding disease, which may have increased the accuracy of the teleconsultation-driven clinical intervention. In addition, previous studies from the pre-COVID era have shown that teleconsultation was similarly effective to face-to-face visits for established RA patients in term of disease activity [6, 7].

The herein review of teleconsultation files from 143 RA patients allowed the identification of two red flags that mainly and independently drove clinical intervention: patient-reported RA flares and increased CRP levels. Patient self-reported flares, defined by worsening of RA along with at least one swollen and tender joint, were a major driver intervention for the clinician in teleconsultation, consistent with a previous study showing that self-reported flares were substantiated by higher disease activity measures, independently associated with pain and swollen joints, and related to treatment escalation [10].

CRP levels were identified as a second red flag and completed patient self-reported flares as an objective measurement of systemic inflammation of RA. However, CRP was lacking in 46% of medical files, which emphasize the need to remind physicians and patients on the importance of blood tests, and particularly CRP, to monitor RA. Patients may also have missed the opportunity to have lab work done given the restricted access to labs during the pandemic, in agreement with a previous study [16].

Teleconsultation makes not possible the clinical evaluation of swollen joints, which may explain why this parameter was barely collected. A perspective would be to use patient-based swollen joints, as suggested by a recent study that reported a good concordance between the patient and the clinician for the number of tender and swollen joints, especially in case of low

disease activity [17]. The American College of Rheumatology (ACR) recommended that RA disease activity measures can be adapted for use in telehealth settings to support high-quality clinical care. In particular, measures requiring formal joint counts can be calculated using patient-reported swollen and tender joint counts [12]. This procedure was applied in the herein study to calculate the DAS-28. Nurse-led programs of patient self-assessment of joint counts and disease activity have previously shown short-term benefits and may be helpful to include tender and swollen joint counts in teleconsultation [18, 19].

Since the evaluation of tender and swollen joints is challenging in teleconsultation, the use of PROs could be one method of deciding which patients would be suited to a teleconsultation or a face-to-face consultation, while ensuring that disease activity is controlled and symptoms important to the patient aren't missed. The RAID score, which comprises seven domains encompassing pain, fatigue, physical function, sleep, physical and emotional well-being and coping, may be an interesting candidate given its strong correlation with the DAS28. [20, 21].

As this study was retrospective, we were only able to collect parameters used by physicians in their daily practice, explaining why many instruments, were not performed including most of PROs.

Therapeutic modification was proposed in teleconsultation to 13/143 (9%) RA patients, which is close to what was previously reported in a cohort of 112 patients with chronic rheumatic disorders seen in teleconsultation, with 17% of patients who experienced treatment modification [22]. Corticosteroids and methotrexate were the preferentially adapted drugs to control disease activity in teleconsultation, highlighting their flexibility and clinician's confidence in their use, even at a distance from the patient. Interestingly, clinicians were reluctant to introduce or change targeted therapies during teleconsultation. These modifications were preferentially done during the face-to-face consultation or day hospitalization after a careful evaluation of disease activity by clinical examination, lab tests and power doppler

ultrasounds. It might also be influenced by patient preference who are more comfortable in adapting the dose of an ongoing therapy rather than introducing a new one particularly at the time of a sanitary crisis.

Beyond technical issues, a critical challenge of telemedicine to perdure after the pandemic and become a routine consultation modality is patient acceptation and satisfaction. Several reports suggest a successful use of telemedicine services in the evaluation and management of rheumatic diseases in the current pandemic situation. Saving of time and money was observed as beneficial factors for patients, with more than three-quarters of all RA patients ready to use teleconsultation in the near future [23]. Another study showed it was possible to transfer rheumatological care activity to teleconsultation with a considerable degree of satisfaction for both the patient and clinicians [24]. This is of importance given the potential future greater importance of teleconsulting in rheumatology because of the lower number of physicians available and due to the patients' unwillingness to travel for a consultation.

This study has some limitations mainly inherent to its retrospective design. Despite it has been suggested that patient-reported measures entered in the EMR has highest potential in teleconsultation [12], PROs are still barely used in daily practice in our department in teleconsultation. Given their importance, we aim to implement their use in a near future. To that end, we are now assessing their value for teleconsultation in a dedicated ongoing prospective study, with a specific focus on the RAID. Patient and clinician satisfaction have also not been evaluated. We did not use any validated questionnaire to collect the number of tender and swollen joints, but we modified existing measures, as recommended by the ACR [12]. Although teleconsultation has the potential to expand the reach of rheumatology practice, some patients still lack the most basic resources required for such type of visit. This point was not analyzed in our study and will need to be taken into consideration in future works.

In summary, our study showed the reliability of clinician intervention in teleconsultation and identified patient reported RA flares and increased CRP values as 2 red flags, independently associated with therapeutic modification and/or the need for a rapid face-to-face consultation. These indicators may help clinician's decision making in teleconsultation and need to be confirmed in independent cohorts.

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**Key messages**

1/ self-reported rheumatoid arthritis flare was the most frequently reported parameter in teleconsultation

2/ Self-reported RA flares and increased CRP levels were independently associated with clinician intervention in teleconsultation

3/ The decision taken by the clinician during the teleconsultation was mostly confirmed during the next face-to-face visit

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**Table 1: Patient characteristics**

| | Patients with rheumatoid arthritis N=143 | Teleconsultation by telephone N=106 | Teleconsultation by video consultation N=37 |
|---|---|---|---|
| **Age (years), mean ± SD** | 58±16 | 59±17 | 58±14 |
| **Age >65years, n (%)** | 53/143 (37) | 42 (40) | 11 (30) |
| **Females, n (%)** | 116/143 (81) | 87/106 (82) | 29/37 (78) |
| **Low socioeconomic status, n (%)** | 28/127 (22) | 24/96 (25) | 4/31 (13) |
| **Comorbidities, n (%)** | 46/136 (34) | 36/102 (35) | 10/34 (29) |
| **Disease duration, mean ± SD** | 14±11 | 14±11 | 13±11 |
| **Positive rheumatoid factor, n (%)** | 100/139 (72) | 75/106 (71) | 25/34 (74) |
| **Positive anti-CCP antibodies, n (%)** | 104/139 (75) | 78/106 (74) | 26/34 (76) |
| **Erosions, n (%)** | 75/140 (54) | 57/106 (54) | 18/35 (51) |
| **Number of tender joints, mean ± SD*** | 2.0±1.8 | 2.1±1.7 | 1.9±2.0 |
| **Number of swollen joints, mean ± SD**** | 1.6±1.3 | 1.6±1.2 | 1.5±0.9 |
| **CRP >10 mg/L, n (%)** | 16/77 (21) | 12/55 (22) | 4/22 (18) |
| **DAS-28, mean ± SD***** | 1.94±0.60 | 2.09±0.65 | 1.57±0.31 |
| | | | |
| **Current treatment** | | | |
| **Corticosteroids, n (%)** | 67/143 (47) | 49/106 (46) | 18/37 (49) |
| **Methotrexate, n (%)** | 96/143 (67) | 67/106 (63) | 29/37 (78) |
| **Leflunomide, n (%)** | 16/143 (12) | 12/106 (11) | 4/37 (11) |
| **Hydroxychloroquine** | 11/143 (8) | 7/106 (7) | 4/37 (11) |
| **Targeted therapies, n (%)** | 70/143 (49) | 52/106 (49) | 18/37 (49) |
| **TNF-α inhibitors, n (%)** | 43/143 (29) | 32/106 (30) | 11/37 (30) |
| **Rituximab, n (%)** | 12/143 (8) | 9/106 (8) | 3/37 (8) |
| **Abatacept, n (%)** | 4/143 (3) | 3/106 (3) | 1/37 (3) |
| **Tocilizumab, n (%)** | 5/143 (3) | 4/106 (4) | 1/37 (3) |
| **JAK inhibitors, n (%)** | 6/143 (4) | 4/106 (4) | 2/37 (5) |

*SD: Standard deviation, DAS-28, Disease Activity Score-28, CRP: C-reactive protein*
** Calculated on 109 patients with available data*
*** Calculated on 48 patients with available data*
**** Calculated on 37 patients with available data*

**Table 2: Frequency of individual data assessing RA status collected during the teleconsultation**

| Parameters | Frequency, n (%) | Frequency in patients > 65 years n (%) | Frequency in patients ≤ 65 years n (%) | p-value | Frequency in males n (%) | Frequency in females n (%) | p-value | Frequency in patients with low socioeconomic status n (%) | Frequency in patients without low socioeconomic status n (%) | p-value |
|---|---|---|---|---|---|---|---|---|---|---|
| **Patient-reported flare since the last visit** | 143/143 (100) | 53/53 (100) | 90/90 (100) | 1.0 | 27/27 (100) | 116/116 (100) | 1.0 | 28/28 (100) | 99/99 (100) | 1.0 |
| **Presence and/or number of tender joints** | 109/143 (76) | 37/53 (70) | 72/90 (80) | 0.17 | 19/27 (78) | 90/116 (78) | 1.0 | 21/28 (75) | 75/99 (76) | 0.91 |
| **Presence and/or duration of morning stiffness** | 95/143 (66) | 30/53 (57) | 65/90 (72) | 0.067 | 15/27 (56) | 80/116 (69) | 0.20 | 17/28 (61) | 66/99 (67) | 0.56 |
| **Presence and/or number of night awakenings** | 95/143 (66) | 29/53 (55) | 66/90 (73) | 0.028 | 13/27 (48) | 82/116 (71) | 0.029 | 17/28 (61) | 68/99 (69) | 0.42 |
| **CRP value** | 77/143 (54) | 28/53 (53) | 49/90 (54) | 0.91 | 14/27 (52) | 63/116 (54) | 0.85 | 11/28 (39) | 58/99 (59) | 0.060 |
| **Patient global evaluation (VAS)** | 68/143 (48) | 24/53 (45) | 44/90 (49) | 0.64 | 13/27 (48) | 55/116 (47) | 0.92 | 8/28 (29) | 55/99 (56) | 0.012 |
| **ESR value** | 51/143 (36) | 20/53 (38) | 31/90 (34) | 0.63 | 9/27 (33) | 42/116 (36) | 0.77 | 7/28 (25) | 38/99 (38) | 0.21 |
| **Presence and/or number of swollen joints** | 48/143 (33.5) | 14/53 (26) | 34/90 (38) | 0.13 | 7/27 (26) | 51/116 (44) | 0.087 | 12/28 (43) | 31/99 (31) | 0.24 |
| **DAS28** | 37/143 (26) | 13/53 (25) | 24/90 (27) | 0.79 | 9/27 (33) | 28/116 (24) | 0.34 | 3/28 (11) | 31/99 (31) | 0.035 |
| **Pain VAS** | 33/143 (23) | 15/53 (28) | 18/90 (20) | 0.27 | 8/27 (30) | 25/116 (22) | 0.38 | 10/28 (36) | 19/99 (19) | 0.059 |
| **Fatigue VAS** | 24/143 (17) | 7/53 (13) | 17/90 (19) | 0.35 | 5/27 (19) | 19/116 (16) | 0.71 | 5/28 (18) | 16/99 (16) | 0.80 |
| **Treatment tolerability** | 63/143 (44) | 22/53 (42) | 41/90 (46) | 0.91 | 11/27 (41) | 52/116 (45) | 0.71 | 12/28 (43) | 44/99 (44) | 0.93 |

*CRP: C-Reactive Protein, VAS: Visual Analogic Scale, ESR: Erythrocyte Sedimentation Rate, DAS28: Disease Activity Score-28*

**Table 3: Disease activity and therapeutic modification of the 10 patients seen during the face-to-face visit or the day hospitalization**

| Patient number | DAS28 | Current treatment | Therapeutic modification |
|---|---|---|---|
| Patient 1 | 4.14 | Etanercept + oral MTX 20 mg/week | switch from oral to subcutaneous MTX 20 mg/week |
| Patient 2 | 3.35 | Certolizumab + Oral MTX 20 mg/week + prednisone 5 mg/day | Switch from certolizumab to etanercept |
| Patient 3 | 3.80 | Baricitinib 4 mg + subcutaneous MTX 10 mg/week + prednisone 5 mg/day | Switch from baricitinib to tocilizumab |
| Patient 4 | 3.97 | Oral methotrexate 10 mg/week + prednisone 5 mg/day | Introduction of upadacitinib |
| Patient 5 | 4.22 | Subcutaneous methotrexate + prednisone 5 mg/day | Introduction of adalimumab |
| Patient 6 | 4.67 | Adalimumab + oral methotrexate 20 mg/week + prednisone 5 mg/day | Switch from adalimumab to etanercept |
| Patient 7 | 4.38 | Subcutaneous methotrexate 20 mg/week | Introduction of etanercept |
| Patient 8 | 5.62 | Tofacitinib + leflunomide 20 mg/day + Prednisone 8 mg/day | Switch from tofacitinib to abatacept |
| Patient 9 | 4.36 | Oral methotrexate 20 mg/week + prednisone 5 mg/day | Introduction of etanercept |
| Patient 10 | 2.32 | Leflunomide 20 mg/day + prednisone 4 mg/day | No therapeutic modification |

**Table 4: Characteristics of patients with rheumatoid arthritis according to the need or not of a clinician intervention**

| | Patients requesting clinical intervention (n=22) | Patients not requesting clinical intervention (n=121) | p-value |
|---|---|---|---|
| **Age (years), mean ± SD** | 54±17 | 59±16 | 0.18 |
| **Age >65years, n (%)** | 6/22 (27) | 47/121 (39) | 0.28 |
| **Females, n (%)** | 20/22 (91) | 96/121(79) | 0.19 |
| **Low socioeconomic status, n (%)** | 5/20 (25) | 23/107 (21) | 0.69 |
| **Comorbidities** | 5/21 (24) | 41/115 (36) | 0.29 |
| **Disease duration, mean ± SD** | 10±10 | 15±11 | 0.049 |
| **Positive rheumatoid factor, n (%)** | 13/21 (62) | 87/118 (74) | 0.25 |
| **Positive anti-CCP antibodies, n (%)** | 12/21 (57) | 92/118 (78) | 0.038 |
| **Erosions, n (%)** | 4/21 (19) | 71/119 (60) | <0.001 |
| | | | |
| **At least one tender joint reported, n (%)*** | 10/20 (50) | 26/89 (29) | 0.072 |
| **At least one swollen joint reported, n (%)**** | 4/8 (50) | 14/40 (35) | 0.43 |
| **RA flare since the las visit, n (%)** | 18/22 (82) | 25/121 (21) | <0.001 |
| **CRP >10 mg/L, n (%)***** | 6/11 (54) | 10/66 (15) | 0.003 |
| **DAS-28, mean ± SD******** | 2.23±1.06 | 1.71±1.02 | 0.30 |
| | | | |
| **Current treatment** | | | |
| **Corticosteroids, n (%)** | 16/22 (73) | 51/121 (42) | 0.007 |
| **Methotrexate, n (%)** | 16/22 (73) | 80/121 (66) | 0.52 |
| **Leflunomide, n (%)** | 2/22 (9) | 14/121 (12) | 0.69 |
| **Hydroxychloroquine** | 2/22 (9) | 9/121 (7) | 0.74 |
| **Targeted therapies, n (%)** | 9/22 (41) | 61/121 (50) | 0.44 |
| **TNF-α inhibitors, n (%)** | 7/22 (32) | 36/121 (30) | |
| **Rituximab, n (%)** | 0/22 (0) | 12/121 (10) | |
| **Abatacept, n (%)** | 0/22 (0) | 4/121 (3) | |
| **Tocilizumab, n (%)** | 0/22 (0) | 5/121 (4) | |
| **JAK inhibitors, n (%)** | 2/22 (9) | 4/121 (3) | |

*SD: Standard deviation, DAS-28: Disease Activity Score-28, CRP: C-reactive protein*
** Calculated on 109 patients with available data*
*** Calculated on 48 patients with available data*
**** Calculated on 77 patients with available data*
***** Calculated on 37 patients with available data*

**Table 5: Logistic regression analysis including clinician intervention as the dependent variable**

| Covariate | Univariate p-value | Odds ratio (95% CI) | p-value |
|---|---|---|---|
| **RA flare since the last visit*** | <0.001 | 15.6 (3.37-68.28) | 0.010 |
| **At least 1 tender joint reported*** | 0.072 | 2.51 (0.42-15.07) | 0.39 |
| **CRP >10 mg/L*** | 0.003 | 3.32 (1.12-13.27) | 0.034 |
| **Morning stiffness > 30 minutes*** | <0.001 | 3.59 (0.33-39.15) | 0.29 |
| **At least 1 swollen joint reported** | 0.43 | - | - |
| **At least one pain-related night awakening** | 0.33 | - | - |
| **Patient global evaluation VAS >1/10** | 0.21 | - | - |

*RA: Rheumatoid arthritis, CI, Confidence interval, VAS: Visual Analogic Scale, CRP: C-Reactive Protein*
** Variables included in the multivariate logistic regression analysis.*
*Disease duration, positivity for anti-CCP antibodies, presence of erosions and current treatment with corticosteroids were also entered in the model as covariates.*

**Table S1: Number of patients seen by each physician in teleconsultation**

| Physician | Number of patients seen n (%) |
|---|---|
| Physician 1 | 11 (8) |
| Physician 2 | 6 (4) |
| Physician 3 | 25 (17) |
| Physician 4 | 15 (11) |
| Physician 5 | 29 (20) |
| Physician 6 | 44 (31) |
| Physician 7 | 8 (6) |
| Physician 8 | 5 (3) |