Impact of the COVID-19 pandemic on the disease course of patients with inflammatory rheumatic diseases: results from the Swiss Clinical Quality Management cohort

Adrian Ciurea1, Eleftherios Papagiannoulis,2 Kristina Bürki,1 Isabell von Loga,2 Raphael Micheroli,1 Burkhard Möller3, Andrea Rubbert-Roth4, Michael Andor,5 René Bräm,6 Angela Müller,7 Diana Dan,8 Diego Kyburz,9 Oliver Distler1, Almut Scherer,2 Axel Finckh10

ABSTRACT

Objectives To investigate whether the transient reduction in rheumatology services imposed by virus containment measures during the COVID-19 pandemic was associated with disease worsening in axial spondyloarthritis (axSpA), rheumatoid arthritis (RA) or psoriatic arthritis (PsA).

Methods Patient-reported disease activity assessed during face-to-face visits and/or via a smartphone application were compared between three periods of each 2 months duration (before, during and after the COVID-19-wave) from January to June 2020 in 666 patients with axSpA, RA and PsA in the Swiss Clinical Quality Management cohort.

Results The number of consultations dropped by 52%, whereas the number of remote assessments increased by 129%. The proportion of patients with drug non-compliance slightly increased during the pandemic, the difference reaching statistical significance in axSpA (19.9% vs 13.2% before the pandemic, p=0.003). The proportion of patients with disease flares remained stable (<15%). There was no increase in mean values of the Bath Ankylosing Spondylitis Disease Activity Index, the Rheumatoid Arthritis Disease Activity Index-5 and the Patient Global Assessment in patients with axSpA, RA and PsA, respectively.

Conclusion A short interruption of in-person patient–rheumatologist interactions had no major detrimental impact on the disease course of axSpA, RA and PsA as assessed by patient-reported outcomes.

INTRODUCTION

The ongoing COVID-19 pandemic remains an important healthcare challenge.1 Data on the course of inflammatory rheumatic diseases during the pandemic are scarce.2 Partial or complete closure of rheumatology services was experienced in many countries as part of virus containment measures and transient lockdown of public life.3 It remains unclear, whether remote consultation strategies might partly compensate for lower numbers of face-to-face visits to prevent a postponement of treatment decisions. Additional factors may also potentially contribute to disease worsening during the pandemic. Some patients may choose to preventively stop immunosuppression out of fear of complications.4 Moreover, the psychological stress (anxiety about a new disease, economic pressure, less recreational opportunities and so on) encountered during the pandemic should not be underestimated.5 The aim of this study was to assess the
Patients diagnosed as having axSpA, RA or PsA in the Swiss Clinical Quality Management (SCQM) cohort6–8 were included if at least one patient-reported disease activity measure was available in each of the study periods defined above, irrespective of whether the assessment was performed during consultations or remotely via a web-based application. All patients currently followed in SCQM, with the exception of the subset of patients with RA, which was younger and had a slightly lower disease activity score at inclusion (online supplemental table S1). The low number of face-to-face visits precluded a comparison between patients with clinical visits and remote data entries. The majority of patients (>70%) were treated with a biological disease-modifying antirheumatic drug (bDMARD) at the study start with the proportion of patients on synthetic DMARDs depending on the underlying disease (table 1). The pre-pandemic proportion of patients with non-compliance to the prescribed medication was around 15%. There was a slight increase in the number of non-adherent patients during the pandemic, the difference to the pre-pandemic numbers reaching statistical significance in axSpA (table 1). Adherence returned to pre-pandemic levels in the post-COVID-19 phase. All patients gave informed consent prior to data collection. Ethical approval was given by the Geneva cantonal committee for research ethics (2020-01708).

**Disease activity assessments**

Patient-reported disease activity assessments included the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) in axSpA,10 the Rheumatoid Arthritis Disease Activity Index-5 (RADAI-5) in RA11 and the Patient Global Assessment (PGA) visual analogue scale for disease activity in PsA,12 both during visits and for app entries. Disease activity measures were investigated for each 2-month period as previously defined. A clinically important worsening in individual patients from period 1 to 2 and from period 2 to 3 was defined as follows: BASDAI showed increase of 2 points in axSpA; RADAI-5 showed increase of 1.4 points in RA11 and PGA showed increase of 1.2 points in PsA.12

**Adherence to treatment**

All other answers except ‘yes’ to the question ‘Do you take the following medication regularly?’ in the monthly app questionnaire were considered as non-compliance with prescribed medication (online supplemental information).
Epidemiology

Table 1 Baseline characteristics of patients, mean disease activity scores as well as number of disease flares and of drug non-compliance cases in the respective 2 months before, during and after the COVID-19 wave in Switzerland

<table>
<thead>
<tr>
<th></th>
<th>Axial spondyloarthritis (N=287)</th>
<th>Rheumatoid arthritis (N=248)</th>
<th>Psoriatic arthritis (N=131)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex, n (%)</td>
<td>141 (49.1)</td>
<td>70 (28.2)</td>
<td>66 (50.4)</td>
</tr>
<tr>
<td>Age (years), mean (SD)</td>
<td>47.1 (11.8)</td>
<td>55.3 (13.2)</td>
<td>52.6 (10.7)</td>
</tr>
<tr>
<td>Disease duration, mean (SD)</td>
<td>17.4 (11.3)</td>
<td>14.0 (10.6)</td>
<td>15.7 (10.7)</td>
</tr>
<tr>
<td>Medication at start of period 1, n (%)</td>
<td>Conventional-synthetic DMARDs</td>
<td>44 (15.3)</td>
<td>142 (57.3)</td>
</tr>
<tr>
<td></td>
<td>Targeted-synthetic DMARDs</td>
<td>3 (1.0)</td>
<td>39 (15.7)</td>
</tr>
<tr>
<td></td>
<td>Biologic DMARDs</td>
<td>203 (70.7)</td>
<td>176 (71.0)</td>
</tr>
<tr>
<td>Patient-reported disease activity, mean (SD)</td>
<td>Period 1</td>
<td>3.40 (2.23)</td>
<td>2.46 (2.05)</td>
</tr>
<tr>
<td></td>
<td>Period 2</td>
<td>3.23 (2.25)*</td>
<td>2.39 (2.03)</td>
</tr>
<tr>
<td></td>
<td>Period 3</td>
<td>3.29 (2.32)</td>
<td>2.47 (2.13)</td>
</tr>
<tr>
<td>Patients with disease flares at follow-up, n (%)</td>
<td>Period 1</td>
<td>7 (2.4)</td>
<td>20 (11.0)</td>
</tr>
<tr>
<td></td>
<td>Period 2</td>
<td>7 (2.4)</td>
<td>27 (10.9)</td>
</tr>
<tr>
<td></td>
<td>Period 3</td>
<td>12 (4.2)</td>
<td>33 (13.3)</td>
</tr>
<tr>
<td>Patients with non-compliance with prescribed DMARD medication, n (%)</td>
<td>Period 1</td>
<td>38 (13.2)</td>
<td>37 (14.9)</td>
</tr>
<tr>
<td></td>
<td>Period 2</td>
<td>57 (19.9)*</td>
<td>55 (22.2)</td>
</tr>
<tr>
<td></td>
<td>Period 3</td>
<td>29 (10.1)*</td>
<td>42 (16.9)</td>
</tr>
<tr>
<td>Patients with documented SARS-CoV-2 infection, n (%)</td>
<td>Period 1</td>
<td>4 (1.4)</td>
<td>10 (4.0)</td>
</tr>
<tr>
<td></td>
<td>Period 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Period 3</td>
<td></td>
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</tr>
</tbody>
</table>

Period 1=pre-COVID-19-wave phase (1 January to 29 February 2020); period 2=COVID-19-wave phase (1 March to 30 April 2020); period 3=post-COVID-19-wave phase (1 May to 30 June 2020).

*Values in bold indicate a significant difference in comparison to the respective value in the previous period (p=0.02 for BASDAI in period 2 vs period 1; p=0.003 and p=0.006 for the proportion of patients with drug non-compliance in period 2 vs period 1 and in period 3 vs period 2, respectively).

BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; DMARD, disease-modifying antirheumatic drug; PGA, Patient Global Assessment of disease activity; RADAI-5, Rheumatoid Arthritis Disease Activity Index-5.

Course of disease and number of disease flares

Patient-reported disease activity outcomes were stable over the first 6 months of 2020 (figure 2 and table 1), with a slight decrease during the pandemic wave, reaching statistical significance in axSpA (mean (SD) BASDAI 3.40 (2.23) before the pandemic and 3.23 (2.25) during the pandemic, p=0.02). To put the disease activity scores in a broader perspective, monthly median values from all SCQM patients are shown separately for physical consultations and remote app entries from January 2019 to June 2020 in the online supplemental figures S1 and S2. The proportion of patients with a disease flare during the pandemic wave was <15% for all three diseases (table 1) and no statistical significance could be found when compared with the proportion with disease worsening in the pre-COVID-19 phase.

DISCUSSION

A web-based smartphone application had been implemented within the Swiss registry long before the current pandemic and allowed us to follow the course of inflammatory arthritides over the whole initial COVID-19 wave. We noted an acute drop in clinical encounters that was paralleled by an increase in app entries. Our study demonstrates that disease activity as assessed by the BASDAI in axSpA, the RADAI-5 in RA and PGA in PsA remained stable and even slightly decreased over the duration of the pandemic wave at the population level. Moreover, a disease flare occurred in <15% of patients, not statistically different from the pre-COVID-19 phase. Although cut-offs for a clinically important worsening exist for the patient-reported outcomes used here for RA and PsA, there is no consensus for a BASDAI cut-off in this regard. We have used a worsening by two points as its performance was comparable with the defined Ankylosing Spondylitis Disease Activity Score cut-off against the external standard ‘patient-worsening’.

Patient-reported worsening was investigated in a recent observational study in patients with RA and patients with axSpA and was experienced by 29% of patients over a duration of 3 months.

The results presented here can only be interpreted in the context of a rather short first COVID-19 pandemic wave as encountered...
in Switzerland. A recent international survey in 35 EULAR (Euro-
pean League Against Rheumatism) countries found that a partial
closure of rheumatology services of 5–8 weeks duration during the
COVID-19 pandemic was reported by 81% of 1428 respondents,3
underscoring the representativeness of our data.

Current guidelines based on preliminary data do not recom-
pense to be reflected in an increase in disease flares.7 To continue or to stop medica-
tion in individual situations during the COVID-19 pandemic
ultimately is part of a shared decision-making process between
the patient and his rheumatologist. We have therefore focused on
patient-reported non-adherence to the medication entered in
the database by the rheumatologist and not on actual drug
changes. We hypothesise that the duration of the pandemic was
too short for the documented transient decrease in drug adher-
ence to be reflected in an increase in disease flares.

Regular assessments of disease activity is a key component
of the treat-to-target principle in the management of rheu-
matic diseases. In addition to the voluntary reporting of disease
activity by the patients, we assume an important increase in the
number of remote patient–physician interactions (email and
phone calls) during the pandemic. Although their actual figures
remain unknown, the influence of telemedicine on the outcome
presented here should not be underestimated.5 We acknowledge
the fact that patient-reported measures cannot replace clinical
examination. Recent data have suggested that their exclusive
use might be insufficient to guide treat-to-target efforts.17 In
the absence of alternatives in the context of suspended visits
to physicians, their use is however warranted.

An important limitation of this work is that we could only eval-
uate patients with regular assessments of disease activity, which
was mostly based on remote data entries during the pandemic.
This subset using the smartphone app is probably more invested
in disease management and the non-compliance figures might be
under-represented.

In conclusion, a temporary interruption of in person consulta-
tions during the COVID-19 pandemic had no major detrimental
impact on the disease course of patients with inflammatory rhea-
matic diseases as assessed through patient-reported outcomes.

REFERENCES