

## Unexpected impact of COVID-19 lockdown on spinal mobility and health perception in spondyloarthritis

Physical therapy (PT) forms the cornerstone of non-pharmacological treatment in axial spondyloarthritis (SpA).<sup>1</sup> The effect of temporary cessation of PT on SpA outcomes is unknown. Therefore, we evaluated the impact of a lockdown during the COVID-19 pandemic on physical activity patterns, spinal mobility and health perception in SpA.

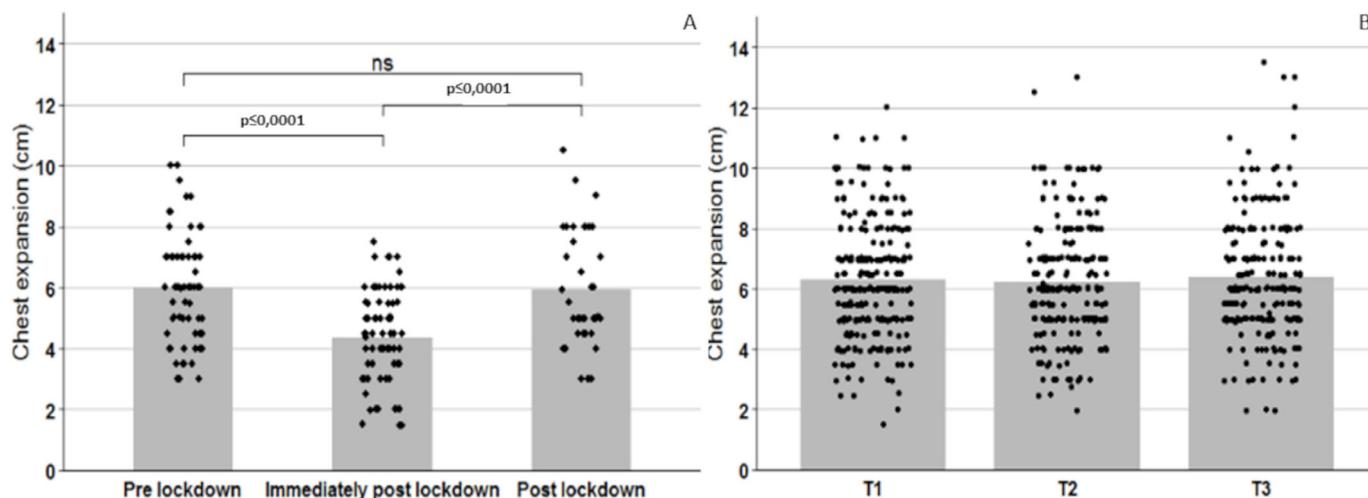
Patients of the BeGIANT cohort, a Belgian multicentre prospective observational registry of newly diagnosed patients with SpA, completed an online questionnaire during the first lockdown in Belgium (March/April 2020), followed by a standardised clinical examination immediately thereafter. The online questionnaire (online supplemental file 1), developed jointly with patient advocacy groups, assessed changes in PT, exercise and sport regimens. We also probed the impact of a lockdown on health perception, including completion of the 36-Item Short Form Survey (SF-36) Questionnaire, Bath Ankylosing Spondylitis Disease Activity Index and Bath Ankylosing Spondylitis Functional Index. Patients from this lockdown cohort were clinically assessed by measuring Bath Ankylosing Spondylitis Metrology Index (BASMI) and chest expansion immediately after the lockdown (May 2020). Data were compared with the last available measurements as part of the standardised follow-up.

The online questionnaire was completed by 185 patients during the third week of the lockdown, of whom 65 patients (35 men, (mean±SD) age 40.8±11.6 years, symptom duration of 10.5±8.0 years) visited our outpatient clinic immediately post-lockdown. All 65 patients had stable disease and therapy prior to the lockdown. Among 33 (51%) patients following PT, 30 discontinued due to inaccessibility as a consequence of the lockdown.

Overall, no significant differences in spinal mobility measures were observed before and after lockdown. However, chest expansion was markedly lower immediately after the lockdown (before:

5.9±0.33 cm; after: 4.3±0.26 cm,  $p\leq 0.0001$ , figure 1A), and not limited to patients who temporarily ceased PT (online supplemental table 1). Intriguingly, chest expansion was significantly related ( $p=0.270$ ,  $p=0.037$ ) to ‘the role of limitations due to emotional problems’ subscale of the SF-36. All BASMI outcomes stayed stable over time whereas chest expansion in the lockdown cohort normalised to pre-lockdown values on the next regular clinical visit after the lockdown (pre: 5.9±0.33 cm; post: 6.1±0.34 cm,  $p=1.0$ ). To determine the clinical relevance of our findings, we used long-term follow-up data from 202 other BeGIANT patients (online supplemental table 2), during a similar time frame before the COVID-19 pandemic. As shown in figure 1B, chest expansion remains remarkably stable over time, underscoring the unusual nature of the observed reduction in chest expansion coinciding with a COVID-19 lockdown. As for the patient’s general health perception during the lockdown, one-third reported this to be worse, while two-thirds reported no difference. Importantly, none of the patients displayed COVID-19 suggestive symptoms nor a positive test result during the evaluated period. Because all clinical assessments from the lockdown onwards were performed in patients wearing a mask, changes in chest expansion were not influenced by wearing a mask.

While it was anticipated that temporary cessation of PT due to the lockdown would strongly impact the overall mobility of patients with SpA, this could not be demonstrated in our study. Likely explanations include a relatively short interruption of PT and the finding that most patients remained equally active by performing exercises and/or sports at home. A striking observation was the reduced chest expansion, independently from prior PT, normalising again after the lockdown. Although this observation was significantly associated with emotional distress, the study design did not enable to demonstrate a causal relationship. However, it is documented that emotional/psychological stress can influence the pulmonary function or evoke difficulties with breathing.<sup>2-4</sup> Psychological distress during the COVID-19 pandemic was recently demonstrated in patients with rheumatic disease, yet the impact on mobility remains unclear.<sup>5,6</sup> Thus, chest expansion might be vulnerable



**Figure 1** (A) Chest expansion in 65 patients with SpA was measured pre-lockdown (left panel), immediately after lockdown (middle panel) and 6 months after the pre-lockdown measurement (right panel). Significance ( $\alpha=0.05$ ) was determined using an ANOVA test for repeated measures. The grey boxes represent the mean, \*\*\*= $p\leq 0.0001$ . (B) Standardised prospective follow-up of chest expansion in a nationwide cohort of patients with SpA (BeGIANT) over a period of 2 years, under stable established pharmacological therapy ( $n=202$ ). Significance ( $\alpha=0.05$ ) was determined using an ANOVA test for repeated measures. Chest expansion at follow-up at month 12 (T1) at month 18 (T2) and at month 24 (T3). The grey boxes represent the mean. ANOVA, analysis of variance; ns, not significant; SpA, spondyloarthritis.

to emotional distress and should be interpreted with caution under such conditions.

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**Acknowledgements** We like to acknowledge all participating patients.

**Contributors** SDM—conception and design of research, acquisition of data analysis and interpretation of data, drafting the manuscript and revision of the manuscript for important intellectual content, final approval of the version to be published and shared first authorship. A-SDC—conception and design of research, acquisition of data analysis and interpretation of data, drafting the manuscript and revision of the manuscript for important intellectual content, final approval of the version to be published and shared first authorship. LD—conception and design of research, acquisition of data, drafting the manuscript and revision of the manuscript for important intellectual content and final approval of the version to be published. TR—conception and design of research, acquisition of data, drafting the manuscript and revision of the manuscript for important intellectual content and final approval of the version to be published. FEVB—conception and design of research analysis and interpretation of data, drafting the manuscript and revision of the manuscript for important intellectual content and final approval of the version to be published. PC—conception and design of research analysis and interpretation of data, drafting the manuscript and revision of the manuscript for important intellectual content, final approval of the version to be published and equal contributorship with DE. DE—conception and design of research analysis and interpretation of data, drafting the manuscript and revision of the manuscript for important intellectual content, final approval of the version to be published and equal contributorship with PC.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Not required.

**Ethics approval** Approval was given by the Ethical Committee of the Ghent University Hospital, Ghent, Belgium.

**Provenance and peer review** Not commissioned; externally peer reviewed.

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► Additional supplemental material is published online only. To view, please visit the journal online (<http://dx.doi.org/10.1136/annrheumdis-2021-220584>).

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SDM and A-SDC are joint first authors.



**To cite** De Mits S, De Craemer A-S, Deroo L, *et al.* *Ann Rheum Dis* Epub ahead of print: [please include Day Month Year]. doi:10.1136/annrheumdis-2021-220584

Received 20 April 2021

Accepted 23 June 2021

*Ann Rheum Dis* 2021;**0**:1–2. doi:10.1136/annrheumdis-2021-220584

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