

## Appraisal

## Critically appraised paper: Three months of high-intensity aerobic exercise and strength training reduce disease activity in axial spondyloarthritis

## Synopsis

Summary of: Sveaas SH, Bilberg A, Berg IJ, Provan SA, Rollefstad S, Semb AG, et al. High intensity exercise for 3 months reduces disease activity in axial spondyloarthritis (axSpA): a multicentre randomised trial of 100 patients. *Br J Sports Med.* 2019;0:1–7. <https://doi.org/10.1136/bjsports-2018-099943>

**Question:** Does high-intensity exercise improve disease activity, compared with standard care, in people with axial spondyloarthritis?

**Design:** Multicentre, two-armed, randomised controlled trial. **Setting:** Three outpatient rheumatology departments in Norway and one in Sweden. **Participants:** Participants had to fulfil the Assessment of SpondyloArthritis International Society criteria for axial spondyloarthritis; be aged 18 to 70 years; have had no change in tumour necrosis factor-alpha inhibitor use during the last 3 months; have moderate to high disease activity at pre-screening; and not have performed regular aerobic or strength exercises (last 6 months). Main exclusion criteria were cardiovascular disease; comorbidity limiting exercise capacity; and/or pregnancy. Randomisation of 100 participants allocated 50 to the intervention group and 50 to the control group. **Interventions:** Exercise was conducted three times per week (two supervised sessions by trained physiotherapists and one unsupervised session) for 12 weeks. Two supervised high-intensity cardiovascular sessions consisted of 38 minutes walking/running on a treadmill or cycle ergometer, with warm up at 70% of maximal heart rate (HRmax), then 4 x 4 minute intervals at 90 to 95% of HRmax, with 3-minute rest periods in between, and a cool down at 70% of HRmax. This was

followed by supervised muscle strengthening (20 minutes), comprising six exercises for major muscle groups (two to three sets with eight to ten repetitions). One unsupervised home cardiorespiratory session comprised at least 40 minutes of walking/running/cycling exercise ( $\geq 70\%$  of HRmax). **Outcome measures:** Primary outcomes were disease activity assessed by Ankylosing Spondylitis Disease Activity Scale and Bath Ankylosing Spondylitis Disease Activity Index at 3 months. Secondary outcomes were inflammatory markers, physical function, spinal mobility, body composition and cardiovascular health. **Results:** Ninety-seven participants completed the study. At 3 months, there was a mean between-group difference in Ankylosing Spondylitis Disease Activity Scale score of  $-0.6$  units (95% CI  $-0.8$  to  $-0.3$ ), and in Bath Ankylosing Spondylitis Disease Activity Index score of  $-1.2$  units ( $-1.8$  to  $-0.7$ ) favouring the intervention. Significant treatment effects were also found for physical function, spinal mobility and estimated peak oxygen uptake in favour of the exercise group. **Conclusion:** High-intensity aerobic interval training in combination with strength training was effective for reducing disease activity in participants with axial spondyloarthritis.

**Provenance:** Invited. Not peer reviewed.

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## Commentary

High-intensity training has been shown to be effective in increasing cardiovascular fitness and muscle strength in healthy people and different patient groups.<sup>1</sup> Less evidence about high-intensity training exists for people with rheumatological diseases. In particular, an absence of randomised controlled trials in people with axial spondyloarthritis hampers physiotherapy clinical practice with these patients. This randomised controlled trial found clinically relevant benefits from a high-intensity exercise program compared with standard care after 3 months in patients with axial spondyloarthritis, suggesting that high-intensity exercises might reduce disease symptoms.

There is a lack of consensus regarding what types and doses of exercises are optimal for long-term clinical benefit in patients with axial spondyloarthritis. In this study, the participants performed two to three exercise sessions weekly for 12 weeks. However, adherence to and effects of high-intensity training beyond 3 months are unknown. In addition, is this program feasible for most physiotherapists to implement in clinical practice? These aspects are particularly important in patients with axial spondyloarthritis because long-term adherence to exercise is a desired physiotherapy treatment goal. Further trials should also investigate the potential dose-response relationship in this patient group by comparing

high-intensity and isocaloric moderate-intensity exercise. It is possible that any exercise intervention may be significantly better than no exercise, and the beneficial effects observed in this study may be due to participation in any exercise program rather than high-intensity training per se.

This study is an important step forward in determining best practice treatment in this group of patients. Future studies could focus on defining prognostic factors, including the role of self-efficacy, as well as exploring barriers to implementing such an exercise program into routine physiotherapy clinical practice.

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## References

1. Alansare A, et al. *Int J Environ Res Public Health.* 2018;15:1508.