RMD Open
Rheumatic & Musculoskeletal Diseases

LETTER

Effect of group-based physiotherapy on pain and depression in patients with axial spondyloarthritis and non-specific low back pain: data of 1-year follow-up

Markéta Hušáková ,[1] Andrea Levitová,[2] Klára Daďová,[2] Daniela Domluvilová,[3] Karel Pavelka[1]

To cite: Hušáková M, Levitová A, Daďová K, *et al*. Effect of group-based physiotherapy on pain and depression in patients with axial spondyloarthritis and non-specific low back pain: data of 1-year follow-up. *RMD Open* 2023;**9**:e003001. doi:10.1136/rmdopen-2023-003001

Accepted 7 April 2023

[1]Institute of Rheumatology and Department of Rheumatology, First Faculty of Medicine, Charles University, Prague, Czech Republic
[2]Faculty of Physical Education and Sport, Department of Adapted Physical Education and Sports Medicine, Charles University, Prague, Czech Republic
[3]First Faculty of Medicine, Department of Psychiatry, Charles University and General Hospital, Prague, Czech Republic

Correspondence to
Dr Markéta Hušáková;
fojtikova05@gmail.com

Physiotherapy (PS) is essential for axial spondyloarthritis (axSpA) and low back pain (LBP) management. Painful symptoms may arise from spine inflammation in axSpA,[1] in non-specific (NS)LBP specific causes are lacking.[2] Regardless of the disease background, mental health (MH) may influence outcomes. Anxiety and depression might support disability and transition to chronicity in NSLBP[3] and worsening of disease activity (DA) or quality of life (QoL) in axSpA.[4] Considering the beneficial effect of physical activity on MH disorders including depression,[5 6] we examined the effect of PS on disease and MH outcomes in axSpA and NSLBP.

The 48 weeks (w) lasted study with once a week supervised group (SG)PS comprised three questionnaire (Q) surveys at baseline, w16 and w48. Briefly, the 1 hour SGPS lesson guided by physiotherapist was focused on core strengthening, core stabilisation muscles activation, spine traction and balance followed by cardiorespiratory fitness and relaxation. Each Q-survey comprised assessment of MH, QoL (5D-EQ), pain intensity (PI, numeric rating scale (NRS)), DA (ankylosing spondylitis (AS) DA score, ASDAS), function (AS Bath functional index, BASFI) and questions for work and sport habits. The self-reported MH questionnaires contained 21 questions reflecting anxiety (Beck anxiety inventory, BAI) and somatic, cognitive and affective signs of depression (Beck depression inventory, BDI-II).

The study followed Declaration of Helsinki, and was approved by the local Ethical Committee and participants provided informed consent. The stable disease and therapy (axSpA), clinical diagnosis of acute NSLBP episode in last 3 months, age (18–60), medical history information were inclusion criteria. Exclusion criteria covered osteoporosis, fibromyalgia, fractures, disk bulging, autoimmune disorders, cancer, chronic infections, pregnancy, current surgery or psychiatric therapy including antidepressants.

Fifty-five individuals attended and 43 of them completed w48. The survival in the study was similar in both groups (table 1). A number of individuals dropped out due to Pregnancy (2), surgery (2), personal reasons (2), changes in axSpA pharmacotherapy (1), infection (1) and absence in three consecutive lessons (4).

At baseline, all variables were almost comparable between axSpA and NSLBP, but the intergroup differences in PI and BDI-II scores significantly changed at w16 and w48 (table 1). In NSLBP, the PI score significantly decreased at w16 (p=0.040) and sustained at w48 (p=0.042). The change (Δ) of PI significantly differed between axSpA and NSLBP in period I (baseline to w16): 0.59; SD: 2.12 and −1.11; SD: 1.99, respectively, p=0.009 and in period II (baseline to w48):0.88; SD: 2.27 and −1.33; SD: 2.27, respectively, p=0.009 (data not shown).

The ΔBDI-II did not differ between axSpA and NSLBP in period I (−0.48±2.56 and −0.73; SD: 2.56, respectively), and period II (−0.50; SD: 2.66 and −1.00; SD: 2.66, respectively), p=ns, data not shown. Of three dimensions the BDI-II at baseline, the somatic scores were significantly higher in axSpA (2.47; SD: 2.54) and NSLBP (1.92; SD: 2.38) compared to the affective and cognitive tasks (axSpA: 1.00; SD: 1.26 and 0.70; SD: 1.71 and NSLBP: 0.48; SD: 0.91 and 0.56; SD: 1.21, respectively), all

Table 1 Demographic parameters and variation of the pain intensity, quality of life, working habits, disease activity, function and psychological outcomes in axSpA and NSLBP

	Baseline			Follow-up:week 16			Follow-up: week 48		
	axSpA (n=30)	NSLBP (n=25)		axSpA (n=27)	NSLBP (n=22)		axSpA (n=26)	NSLBP (n=17)	
	Mean (SD)	Mean (SD)	P value	Mean (SD)	Mean (SD)	P value	Mean (SD)	Mean (SD)	P value
Survival on the study (%)				90.0	88.0	0.999	87.0	68.0	0.895
Pain intensity (NRS)	2.90 (2.04)	2.18 (2.28)	0.102	3.78 (2.73)*	0.96 (1.61)†	0.0003	3.77 (2.61)*	0.59 (0.80)†	<0.0001
EQ-5D	0.79 (0.16)	0.82 (0.22)	0.131	0.79 (0.16)*	0.84 (0.18)*	0.123	0.79 (0.15)*	0.83 (0.20)*	0.229
BAI	3.77 (3.69)	3.58 (4.11)	0.811	4.44 (4.81)*	2.73 (3.34)*	0.258	4.42 (4.50)*	1.88 (2.89)*	0.055
BDI-II	4.20 (4.79)	2.92 (3.87)	0.353	3.44 (3.86)*	1.86 (2.70)*	0.072	3.58 (3.78)*	0.71 (1.26)*	0.0006
ASDAS-CRP	1.75 (0.64)	NA	NA	1.70 (0.81)*	NA	NA	1.96 (0.68)†	NA	NA
BASFI	0.61 (0.73)	NA	NA	1.39 (1.45)†	NA	NA	1.45 (1.45)†	NA	NA
Working and sport habits									
The full ability to work (%)	97.0	92.0	0.895	85.2	95.5	0.362	84.6	94.2	0.633
Regular sport activities at least 2 hours per week (%)	40.0	56.0	0.285	44.4	59.1	0.393	38.5	70.6	0.062
Demographic data									
Age	41.80 (8.17)	39.12 (9.55)	0.207						
Gender (% of males)	73.0	44.0	0.052						
BMI	25.20 (2.79)	24.40 (3.56)	0.146						
CRP (mg/L)	4.08 (2.68)	3.02 (0.72)	0.235						
Education: master degree (%)	57.0	64.0	0.782						
Employment: white collars (%)	87.0	92.0	0.678						
Physiotherapy consumption (%)‡	47.1	57.7	0.446						
Current smokers (%)	23.0	8.0	0.159						
HLA B27 positive (%)	87.0	NA	NA						
Radiographic vs non-radiographic axSpA (%)	73.0 vs 27.0	NA	NA						
EAMs (%)	50.0	NA	NA						
Age at the time of first axSpA symptoms	24.97 (8.31)	NA	NA						
Disease duration since first symptoms	16.97 (9.46)	NA	NA						
Age at the time of axSpA diagnosis	31.70 (6.57)	NA	NA						
Therapy: bDMARDS (%)	23.0	NA	NA						
Therapy: NSAIDs daily use (%)	86.0	NA	NA						

P value demonstrates intergroup differences (Mann-Whitney test).
*Intragroup comparison to baseline (Wilcoxon matched pairs test), P=ns.
†Intragroup comparison to baseline (Wilcoxon matched pairs test): Pain w16 P=0.040; Pain w48 P=0.042; ASDAS-CRP p=0.002; BASFI w16 P=0.001; w48 P=0.001.
‡10 lessons of individual physiotherapy or 3-week spa therapy during least 3 months.
ASDAS-CRP, ankylosing spondylitis disease activity index; axSpA, axial spondyloarthritis; BAI, Beck Anxiety Inventory; BASFI, Bath ankylosing spondylitis disease functional index; BDI-II, Beck Depression Inventory; bDMARDS, biologic disease modifying antirheumatic drugs; BMI, body mass index; CRP, C reactive protein; EAMs, extraarticular manifestations; EQ-5D, European quality of life questionnaire; NA, not analysed; NRS, Numeric rating scale; NSAID, non-steroidal antirheumatic drugs; NSLBP, non-specific low back pain.

p<0.01. The scores for the affective and somatic dimensions of the BDI-II at w48 were significantly decreased in NSLBP (0.06±0.24 and 0.82±1.24, respectively) but not in axSpA (0.81; SD: 1.17 and 2.67; SD: 1.87, respectively), with both p<0.01 (data not shown).

Of all participants reaching w48, ΔBDI-II decreased significantly in females compared to males during period I (−2.06; SD: 2.89 to 0.19; SD: 1.92; p=0.008) and II (−2.19; SD: 2.99 to 0.19; SD1.92; p=0.004; data not shown).

In axSpA, the BASFI worsened during period I and II and the ASDAS-CRP between w16 and w48; all p<0.05 (table 1).

We conclude, regular SGPS may improve MH and disease outcomes in NSLBP but not axSpA during 1-year follow-up. In axSpA on stable therapy, once a week SGPS only might not be sufficient for maintaining disease activity and function.

Acknowledgements All authors would like to thank Mr Dr Petr Fučík for statistical analysis and consultation. Mrs Alena Swienteková, Mrs Barbora Smetanová and Mr Václav Dráb for technical support.

Contributors MH: design of the study, contribution to the acquisition of the patients with axSpA data, analyses and interpretation of the data and contribution to the acquisition of the patients with NSLBP data, interpretation of the data, responsibility for the correct inclusion and exclusion patients from the study, selection of questionnaires for axSpA and patients with NSLBP, preparation of questionnaires for use and interpretation of the data, analyses of the data, communication with statistics, drafting a paper, revising a paper and final approval of the paper. AL: design of the study, contribution to the acquisition of the patients with NSLBP data, interpretation of the data, leader of the exercise lessons as physiotherapists' schedule and design of the exercise lessons, selection of type of exercises, provision of questionnaires for axSpA and NSLBP at the beginning and during follow-up, revising of the paper and final approval of the paper. KD: contribution to the acquisition of the patients with NSLBP data, back-up for AL during exercise lessons, consultation about the composition of the exercise lesson including type of selected exercises, revising a paper and final approval of the paper. DD: selection of psychological questionnaires and interpretation of the data, revising a paper and final approval of the paper. KP: contribution to the acquisition of the patients with axSpA data, interpretation of the data, consultation about design of the study, consultation about the analysed data and results of the study, revising of the paper and final approval of the paper.

Funding This study was supported by Development of science at Charles University in Prague: COOPERATIO, by the Ministry of Health, Czech Republic: Project for the conceptual development of research organisation 00023728 Institute of Rheumatology and by the Czech Health Research Council: NU21-09-00297.

Competing interests None declared.

Patient consent for publication Consent obtained directly from patient(s).

Ethics approval The study was approved by the Prague Faculty of Physical Education and Sport at Charles University in Prague, Czech Republic (Number: 193/2017). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iD

Markéta Hušáková http://orcid.org/0000-0002-6867-4373

REFERENCES

1 Sieper J, Poddubnyy D. Axial spondyloarthritis. *Lancet* 2017;390:73–84.
2 Solomon CG, Chiarotto A, Koes BW. Nonspecific low back pain. *N Engl J Med* 2022;386:1732–40.
3 Calvo-Lobo C, Vilar Fernández JM, Becerro-de-Bengoa-Vallejo R, *et al*. Relationship of depression in participants with nonspecific acute or subacute low back pain and no-pain by age distribution. *J Pain Res* 2017;10:129–35.
4 Zhao S, Thong D, Miller N, *et al*. The prevalence of depression in axial spondyloarthritis and its association with disease activity: a systematic review and meta-analysis. *Arthritis Res Ther* 2018;20:140.
5 Chekroud SR, Gueorguieva R, Zheutlin AB, *et al*. Association between physical exercise and mental health in 1·2 million individuals in the USA between 2011 and 2015: a cross-sectional study. *The Lancet Psychiatry* 2018;5:739–46.
6 Ross RE, VanDerwerker CJ, Saladin ME, *et al*. The role of exercise in the treatment of depression: biological underpinnings and clinical outcomes. *Mol Psychiatry* 2023;28:298–328.