

## SUMMARY

**Title:** Comparison of educational and compensation exercise programmes for ankylosing spondylitis patients

**Objective:** The objective of the research was to determine the effect of two educational and compensation exercise programmes on the mobility of the axial system, the functional status and disease activity (including inflammatory process activity) in individuals with ankylosing spondylitis.

**Methods:** The research group included men and women (average age of  $35.42 \pm 7.15$  years), all out-patients of the Institute of Rheumatology in Prague. This characteristic sample ( $n = 38$ ) consisted of respondents who were randomised into three groups: The first experimental group ( $n = 13$ ) attended an educational and compensation exercise programme in a group setting in a gym (twice a week) and an educational and compensation exercise programme in the form of a group exercise in a pool – hydrokinesiotherapy (once a week); the second experimental group ( $n = 13$ ) attended the same educational and compensation exercise programme in a group setting in a gym (twice a week); the control group educational and compensation exercise programme in a group setting in a gym (twice a week) received no exercise intervention but its members were allowed to use “passive” physiotherapeutic procedures (e.g. hydrotherapy or electrotherapy).

It was a randomised, comparative, intergroup, single-factor and three-level experiment (experimental factor = exercise intervention; three levels = three groups). It may also be described as an intra-group experiment with inter-individual changes monitored in subjects divided into three groups over a given period of time (at the beginning, after three months and at the end of the experiment, i.e. after five months).

The experiment focused on three key output variables: mobility of the axial system, the functional status and disease activity including evaluation of the inflammatory process activity. Axial system mobility was assessed using the following measurement methods: Bath Ankylosing Spondylitis Metrology Index (BASMI) – this method measures five mobility parameters (cervical rotation, tragus to wall, Schober's test – modified, lumbar side-flexion, intermalleolar distance) and chest expansion. Functional status was assessed subjectively based on a standardised questionnaire – the Bath Ankylosing Spondylitis Functional Index (BASFI). Disease activity was assessed subjectively based on the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI). Inflammatory process activity in the first and the second experimental group was assessed objectively twice during the experiment – at the

beginning (a pre-test) and after three months (a post-test) – with values obtained by lab tests on blood samples focusing on acute phase reactants (C-reactive protein, erythrocyte sedimentation rate) and other inflammation parameters – adipocytokines (resistin, leptin, adiponectin, visfatin). The effect of the exercise intervention was assessed by analysis of dispersion with repeated measurement 3 x 3 or 2 x 2 (time x intervention).

**Results:** In the first and second experimental groups, axial system mobility significantly increased after three months with improvements in all BASMI parameters ( $p = 0.00$ ) and chest expansion ( $p = 0.00$ ). After another two months (second measurement vs. third measurement), improvements were recorded only for certain BASMI parameters, specifically for tragus to wall ( $p = 0.01$ ) and cervical rotation to the right ( $p = 0.00$ ); changes in cervical rotation to the left were just above the significance level ( $p = 0.06$ ) and significant increase in chest expansion was also identified ( $p = 0.01$ ). No statistically or materially significant changes were recorded for other BASMI parameters. After three months of exercise intervention, functional status, as assessed by the BASFI questionnaire, significantly improved in both experimental groups ( $p = 0.00$ ). Significant changes continued to be reported even after the next two months ( $p = 0.01$ ) of exercise intervention. There were no significant changes between the first and the second experimental group (we recorded only slight changes in mean values between groups, but not significant). The three-month intervention and the follow-up two month intervention in the first and second experimental groups did not result in any significant improvements in disease activity detectable by the BASDAI questionnaire. Neither the first nor the second experimental group showed any significant changes in inflammatory process activity after three months of exercise intervention in terms of acute phase reactants (erythrocyte sedimentation rate and C-reactive protein). In addition, we show for the first time that the levels of serum adipocytokines leptin, adiponectin, resistin and visfatin are not modulated by intensive physiotherapy.

**Key words:** ankylosing spondylitis, exercise therapy, educational and compensastion programme, adipocytokines, acute phase reactants