6. Abstract

Locomotor system dysfunctions in the course of RA and osteoarthritis lead to disturbances within the sensorimotor control system. The impairment of postural control is associated with an increased risk of falls and, in consequence, to disability and decrease in the quality of life.

The aim of the study was to assess postural disorders in patients with rheumatoid arthritis and osteoarthritis. Comparison has been made between proprioception disorders, foot arch, stabilometry and balance between RA patients, OA patients and a group of healthy subjects. The influence of the activity of rheumatoid process, the duration of the disease, degree of pain, BMI and age on postural control as well as the risk of falls have been assessed.

The study has been conducted in a group of 71 patients (including 41 patients with RA and 30 with osteoarthritis of the lower limb joints) treated in the Department of Rehabilitation, University Hospital in Białystok. The control group consisted of 56 healthy subjects. RA has been diagnosed according to the ACR (American College of Rheumatology) and EULAR (European League Against Rheumatism) criteria of 2010. To assess the stage of RA, the classification according to Steinbrocker has been used, and the degree of disease activity has been established basing on DAS 28 index. The assessment of the progression of osteoarthritis has been based on clinical and radiological examination.

A stabilometric examination including analysis of gravity center or foot pressure displacement (COP) has been performed. In addition, balance examination has been performed in the single leg stance (SLS), during which the number of supports has been calculated within 30 seconds. In addition, a proprioception study has been conducted to determine the ankle joint position sense (JPS) as well as functional proprioception evaluation. Examinations have been conducted using the TecnoBody balance platform model PK 254 with the PRO KIN Line Software, which allows recording and analysis of test results. The static foot efficiency test has been performed using a podoscope along with a 3D scanner and CQ ST2K software for foot examination. The analysis included the Wajsflog, Sztriter - Godunov index and Clark angle.

Statistically significant differences have been found between the groups within the area of movement copying error without visual inspection of plantar flexion, while in patients with RA the error was the most significant, and the slightest – in healthy subjects. Statistically significant differences regarding error have been observed between the healthy group, in which the error rates and range were lower, and both groups of patients. In the stabilometric evaluation, statistically significant differences between the groups of patients in the Romberg index have been found, describing the comparison of examination results with open and closed eyes. Patients with osteoarthritis revealed higher Romberg index values than patients with RA. It has been proved that RA patients performed statistically significantly more supports within 30 seconds in the SLS balance evaluation, in comparison to patients with osteoarthritis.

In patients with higher RA activity index, statistically significantly higher values of movement copying errors have been found in joint position sense (JPS) examination and impaired body stability in the stabilometric examination in comparison to the group with lower disease activity. Patients with higher RA activity proved higher number of supports in the SLS examination in relation to patients with moderate RA activity. In addition, correlation between the activity of rheumatoid process and the results of proprioception studies, stabilometry and SLS balance have been demonstrated. In the group with high RA activity, statistically significant correlation indicating the impairment of body stability along with the degree of radiological changes has been demonstrated. It has been proved that in the group of patients with higher disease activity rate along with the increase in the degree of advancement of functional changes, the rate index of the Sztriter-Gudonów foot decreases.

The relation between age, duration of the disease, BMI and the severity of pain in the VAS scale with the results of proprioception and postural control has been observed.

It has been proved that in both groups of patients, those who had at least one fall, revealed more significant errors in the examination of joint position sense, in relation to subjects who did not report falls in the past. In the group of osteoarthritis patients, statistically significant poorer stabilometric control (Romberg index) and higher number of supports in the SLS study have been observed in subjects who experienced at least one fall in the last year, compared to subjects without falls.

The obtained results indicate that the assessment of postural control in patients with RA and osteoarthritis should be an important element of the diagnostic procedure, in order to detect the risk of falls and introduce individual therapeutic strategies.