

## **Summary**

**Title: Assessment of the hip joint using Magnetic Resonance Imaging in patients with hip osteoarthritis undergoing rehabilitation**

Rehabilitation is considered to be effective in reducing the burden of a disease in patients with symptomatic hip osteoarthritis (HOA) and constitutes the officially recommended therapeutic approach. However, there are relatively few reports in the literature focusing on this form of treatment of patients with HOA. Most of the assumptions regarding the rehabilitation for HOA are an extrapolation of conclusions from studies on osteoarthritis of the knee. In addition, the measurement tools used to assess the impact of rehabilitation are mainly based on questionnaires providing patient-reported outcomes of symptoms and quality-of-life as well as performance-based tests (PBTs) of physical activity.

Therefore, to expand the knowledge of the importance of rehabilitation in HOA, a 12-month physiotherapeutic treatment was performed involving patients showing typical symptoms. Subsequently the results of their structural and functional assessment were analyzed. The publication series based on this research includes two original papers describing the results of a prospectively conducted study and a review paper of the imaging methods, serving as an introduction.

The publication titled *Advances in Imaging of Hip Osteoarthritis* provides an overview of imaging methods used in the diagnostics of HOA. It discusses X-ray techniques, ultrasound and magnetic resonance imaging (MRI), which are used in the diagnosis and monitoring of HOA. The limitations and advantages of particular methods are presented, and the potential of their use in clinical practice and research studies is emphasized. The characteristics of the methods described support the choice of the evaluation tool used in the study.

The paper titled *The Use of Scoring Hip Osteoarthritis with MRI as an Assessment Tool for Physiotherapeutic Treatment in Patients with Osteoarthritis of the Hip* describes the possibilities of using MRI-based semi-quantitative scoring system (Scoring Hip Osteoarthritis with MRI, SHOMRI), as an assessment tool in physiotherapeutic intervention. The paper describes the outcomes of the structural assessment of the hip carried out during the one-year rehabilitation program. The relationship between radiological and functional

evaluation was also discussed. Moreover, the reliability-related parameters of SHOMRI were calculated.

In the work titled The impact of a long-term physiotherapy program on hip function in patients with hip osteoarthritis, the effect of the conducted physiotherapeutic treatment on the functional status of patients was discussed. The relationship between questionnaire-based) and PBTs was described. When analyzing the results, the presence or absence of progression of degenerative changes were taken into account.

During the one-year observation period, the study group showed no structural changes in SHOMRI, but a trend of disease progression was noticeable in the group of people performing physical occupation. An improvement was demonstrated depending on the state of structural progression in objective or subjective functional status. The relationship was observed between SHOMRI and HOOS (Hip dysfunction and Osteoarthritis Outcome Score) and some subscales thereof, as well as between PBTs and some HOOS subscales. On the basis of the study conducted, it can be concluded that the SHOMRI is characterized by very good reliability parameters, but its ability to identify subtle structural changes limits its applicability in the assessment of physiotherapeutic treatment.