

ABSTRACT

Motor control exercises involving muscles of the pelvic girdle as potentially resulting in changes to the functional and structural parameters in patients with hallux valgus

Introduction: The available literature that is in line with *evidence-based medicine* demonstrates methods of treatment of the hallux valgus only locally, i.e. in the site where it occurs, even though the abnormality often results from compensation patterns present in the upper body parts. Therefore, it is justifiable to attempt a detailed and fully controlled clinical study with an analysis of the effectiveness of the therapy based on the principles of motor control in the body part responsible for the relevant compensation pattern, here being the pelvic girdle.

Purpose: The purpose of the study was to determine whether the motor control exercises involving muscles of the pelvic girdle could potentially change the functional and structural parameters in patients with hallux valgus, and to identify appropriate structures to be included in the physiotherapy process in terms of prevention and therapy.

Research questions: Do motor control exercises involving muscles of the pelvic girdle change the functional and structural parameters in patients with hallux valgus? Do motor control exercise involving muscles of the pelvic girdle affect the pain in feet?

Materials and methods: The study included a group of 40 subjects who had been diagnosed with hallux valgus with mild and moderate deformity. They were divided into two reference groups: the treatment group (n=20) that did exercises based on the principles of motor control with biofeedback and muscle activation; and the placebo group that followed the principles of active exercises, but without biofeedback or muscle activation. All the patients were equipped with silicone toe separators.

Subjects from both reference groups took part in a 10 weeks' individual therapy, exercising 5 times a week. The visual analogue scale (VAS), ¼ squat test, test checking the length of rectus femoris, dissociation test with hip extension, slump test, pelvic tilt measurement, surface EMG, podoscope examination and treadmill gait test were all used to evaluate the functional status.

Results: As a result of the performed therapy, statistically significantly better values regarding the correction of hallux valgus and the angle of inclination as well as the improved hip joint

function were observed in the treatment group as compared with the placebo group. Furthermore, the pain in the lower limb was visibly reduced.

Conclusions: The examined motor control exercises involving muscles of the pelvic girdle seem to be effective in changing the functional and structural parameters of the lower limb in patients with hallux valgus. This kind of therapy significantly affects the correction of hallux valgus, improves the range of movement of the hip and knee joints, and balances the angle of inclination, thus restoring the function of the entire biokinematic chain of the lower limb. Beneficial clinical outcomes are often more effective than those related to the standard treatment. The motor control exercises have greater pain-reducing effects (especially locally within the hallux valgus deformity) as compared with standard active exercises.

Keywords: hallux valgus, motor control.