

## **Testing the postural stabilization of the movement system and evaluating the dysfunction of the postural cybernetic of the movement system by a new method postural somatooscillography**

Abstract:

Introduction: For the objectification of the structural damages in the musculoskeletal system there are many research methods and imaging techniques. For the investigation of the stabilization of the locomotion system a simple, reliable method for the clinical and instrumental evaluation of the pain-body is missing so far. These methods probably would include the cause of the dysfunction of the stabilizing mechanisms in vertically integrated persons. Therefore I introduce a Postural Somatooscillography in this work, which is a new kind of posturography on a Posturomed surface that can be unstable in a metered way. Second, a new technique of "provocation test" (Step/Stand) is introduced here. In this test, standardized claims to the increased postural stability and so on the nature of the cooperation of the intersegmental muscles and the superficial polysegmental muscles are made evident. Either caused by a good segmental stabilizing a good economic posture, without pain, or non-economic activation of polysegmental muscles caused postural related pain in these congested superficial muscles.

Objectives: My aim is the determination of the differences in postural stabilization of the locomotion system in healthy people and people with pain in the body in postural instability. This is reached by testing with the specific-area-Posturomed that has been used since 1993 (Rašev 1993) for the study of postural stabilization ability of a well-defined single-leg stand followed by standardized steps on the spot. The purpose of this technique is a defined transfer of gravity in the human body. In addition, I sought for specific parameters to characterize the quality of postural stabilization in the test of postural Somatooscillography first introduced by me. Next, in selected patients treatment was carried out to influence postural stability. After this treatment, the changes in postural stabilization were investigated in this group of patients by Postural Somatooscillography.

The main objective of this study was the validisation of the new diagnostic method Postural Somatooscillography and of the new clinical test of postural stability on the standardized unstable surface Posturomed therapy.

Groups of patients: There were studied two groups of individuals. The first group of 24 people consisted of postural-healthy persons, who in the last two years had been without pain, in good physical and mental condition, without clinical signs of postural pathology. There was no evidence of neurological or orthopedic disorders with them. On the visual numeric scale the intensity of pain in recent years was 0, i.e. no pain. The second group (28 persons) consisted of patients with severe clinical symptoms of postural dysfunction and recurrent musculoskeletal pain, which were dependent on the stabilization of the body's standing and sitting while working with the upper extremities.

Research methods: In both groups a provocation test step /stand on the special test area Posturomed was conducted. The oscillations of the area Posturomed caused by body-sways were registered by acceleration sensors of the diagnostic system Microswing and were evaluated by means of Postural Somatooscillography, applying Posturomed Commander, a newly developed program. Differences observed were statistically analyzed in SPSS program. In selected patients showing typical postural pain treatment was carried out using the postural

elements; later, these patients were measured after the treatment, as before the therapy, using postural Somatooscillography.

Results: In the first group the values of stability parameters were better than in patients with postural dysfunction, in particular the damping of the sways of the surface Posturomed during the 8-second single-leg stand test. Significantly better stabilization also could be observed after the treatment of selected individuals. Because of the small sample size, the results we have can not be generalized, however.

Conclusions: We could identify patients with postural dysfunction in the trunk. It could be proved that the new method is suited to study the postural instability with a new program Posturomed Commander. By this program, Postural Somatooscillography, an objectification of clinical postural dysfunction is possible in people working in vertical positions for a long time. These people overload the stabilization of their trunks by activities mainly in sitting.

Key words:

posture, test postural stabilization, postural dysfunction, pain, Postural Somatooscillography,