

## ISOKINETIC DIAGNOSTICS IN PATIENTS WITH LOW BACK PAIN

<sup>1</sup>Kuvalja S, <sup>1</sup>Desnica Bakrač N, <sup>1</sup>Jurić-Šolto G, <sup>1</sup>Šučur Ž, <sup>2</sup>Gnjidić Ž

<sup>1</sup>Cybex Center for Isokinetic Diagnostics and Rehabilitation, Voćarska 106, Zagreb

<sup>2</sup>Dpt of Neurosurgery, Clinical Hospital "Sestre Milosrdnice", Vinogradska 29, Zagreb

In this paper we report new findings on muscle strength imbalance in patients suffering of low back pain syndrome. The group which underwent isokinetic diagnostics and rehabilitation, consisted of 32 patients (11 males, 21 females), aged 20 - 60 yrs. (working population).

Isokinetic diagnostic testing has proven to be a very reliable method of quantifying muscle strength. In isokinetics, constant speed of motion is chosen and the resistance is accommodating automatically. In this study, isokinetic testing was done for extensors and flexors of hips and knees on Cybex Orthotron KT2 machine. For these muscle groups, detailed dynamic status was taken for each leg separately. This included: peak torque, work per repetition, range of motion, total work done, and fatigue index. On Cybex 6000 isokinetic machine we have tested extensors and flexors of the trunk, examining the same parameters.

The results obtained have shown that the knee extensors and flexors were reasonably well balanced. Some imbalance was found for trunk extensors and flexors: mean percentage for trunk extensors was 71% and for trunk flexors 82%. However, the greatest imbalance was found on the antagonistic muscles of the hip, where the mean values of muscle strength have been 72 % for hip extensors and only 50 % for hip flexors. All these numbers represent percentages of the standard expected value for each subject, taking into account age, gender, height, weight and level of physical activity.

These results strongly suggest that this great muscle strength imbalance found between flexors and extensors of the hips, could be crucial in the development of low back pain symptoms, putting extra strain on the spine, and damaging appropriate bio-mechanical relations. This contrasts the commonly accepted understanding that the weakness of trunk extensors and flexors is the main cause of low back pain. This finding implies that in such patients, muscle strength evaluation should be performed on the hip-muscle groups in the first place, but should also include muscles of the whole kinetic chain important for the lower part of back (knees, hips and trunk extensors and flexors). Consequently, it is very important to perform the rehabilitation in the same way, starting with strengthening of extensors and flexors of the hips and knees, adding exercises for trunk extensors and flexors later. This result is also very important in prevention (especially for the professionally endangered groups of population), suggesting that, to avoid low back pain problems, exactly these antagonistic muscles should be tested and rehabilitated, if necessary.