POSTURAL CONTROL IN MEN WITH KNEE OSTEOARTHRITIS

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Introduction

Knee osteoarthritis (OA) is a major disabling joint disease among elderly people. According Hassan et al. [1] and Masui et al. [2] patients with knee OA have weakened postural control. Since the impaired balance is one risk factor for causing falls in older adults [3], it is important to study the dynamics of the balance also in OA patients. The aim of this study was to examine the standing balance under four different test conditions in men with knee OA and to compare the results with those of age-and sex-matched healthy controls.

Methods

Patients with uni- or bilateral knee OA (n=54, aged 49-68 years) and 53 age-matched randomly selected healthy men were studied. Postural control was assessed in four different conditions with a force platform (AMTI, USA). Test conditions were bipedal stance with eyes open and closed and monopedal stance eyes open on both legs separately. Subjects stood barefoot on the force platform with their feet positioned to shoulder width and their arms by their sides. On a monopedal stance subjects were instructed to hold their contralateral limb in 90° of knee flexion during the test. After familiarization balance testing was performed three times in every condition, each lasting 30 seconds. If loss of balance was imminent, testing was ceased for that particular condition. The trial order was randomized. Differences in measured balance parameters, mean sway velocity (MSV), velocity along A-P and M-L axes (VAPA and VMLA), elliptical area (EA) and standard deviation of COP (SDCOP), between OA patients and controls were tested by a MANOVA with analysis of covariates (height, weight and knee pain).

Results

During bipedal stance with eyes closed and open, there was no significant difference in the MSV between knee OA patients (19.0±5.0cm/s, 15.0±3.3cm/s) and controls (17.8±5.4cm/s, 13.9±2.9cm/s), respectively. Ten (18.9%) of healthy subjects and fourteen (25.9%) of OA subjects were unable to maintain monopedal stance for 30 s (p=0.46). During monopedal stance, there was no difference between knee OA patients and controls in MSV (65.4±16.8cm/s; 71.2±19.0cm/s) and there was neither difference in VAPA, VMLA, EA or SDCOP parameters between OA patients and controls which could maintain monopedal stance for 30 s. Among the patients, there were no significant differences in the balance parameters between the radiographic OA-subgroups.

Conclusions

Contrary to our initial hypothesis and earlier studies [1,2], we found no significant differences between the OA and the healthy subjects in postural control. We suggest that maybe some compensatory factors such as increased levels of muscle activity may provide additional stability in knee OA. Possible explanations for recent findings require further study.

References


Keywords: Knee OA, Postural control, Force platform