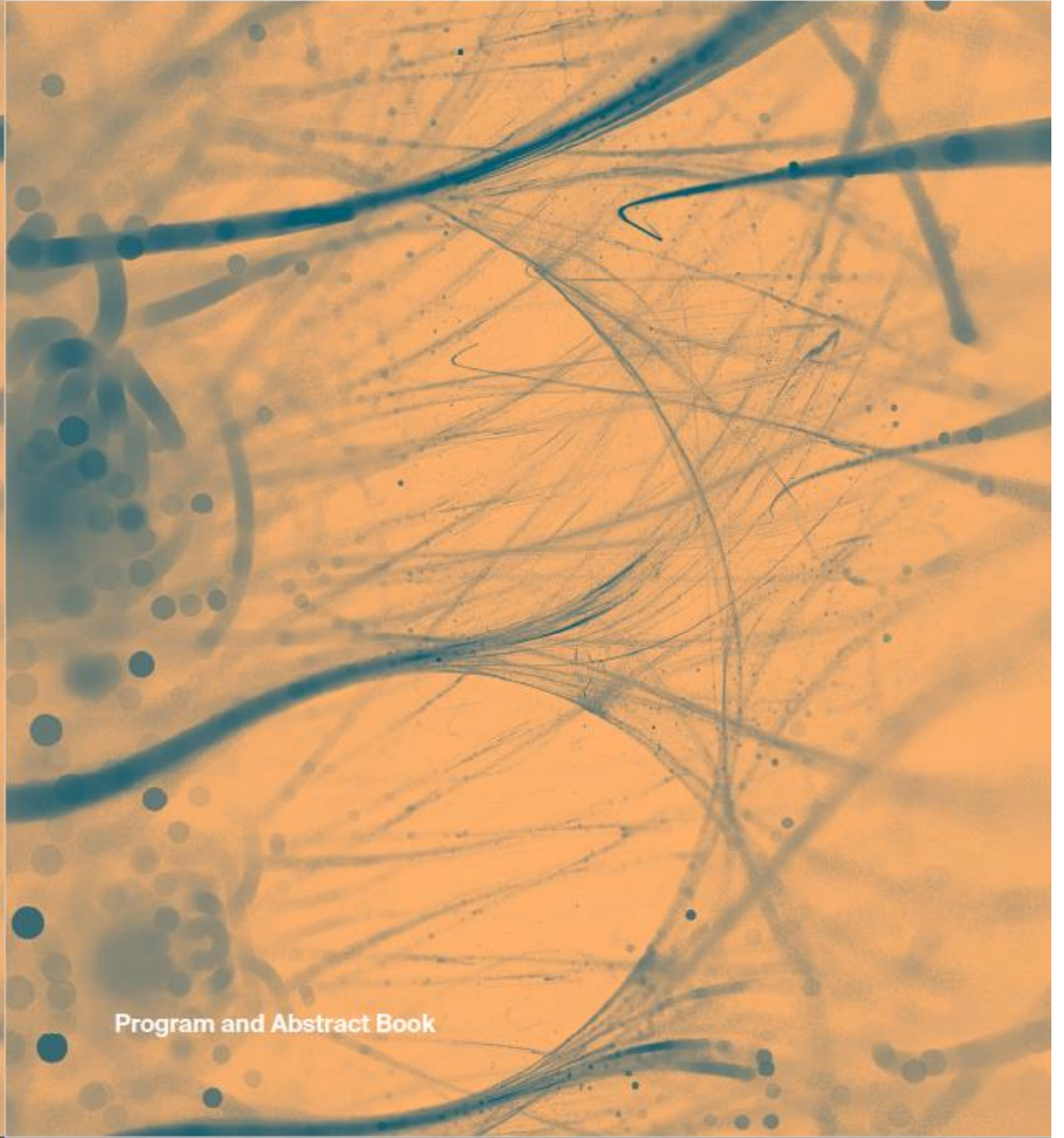


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sciforum-098862: Effect of knee joint fixation on human postural stability

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Introduction

The analysis of motor strategies includes only ankle and hip strategies, without considering the possible role of the knee joint, although coordinated control of knee joint movements plays a significant role in maintaining posture stability.

Methods

Electromyography and stabilometry parameters were recorded in healthy subjects with and without knee joint fixation. The tests included: eye-open test (control), Romberg test, and "Target" test.

Results

Stabilometry results of control and knee fixation were compared. Knee fixation reduced the total power of pressure center oscillations in all tests except for the Romberg test with closed eyes, in which some shift of the spectrum to higher frequencies was observed. At the same time in the test "Target" both in norm and at knee fixation the spectrum shifted to the zone of higher frequencies, the changes were less pronounced in the experimental group. At restriction of knee joint mobility there was a decrease in the activity of the anterior tibial muscle. During visual deprivation in the Romberg test, the electrical activity of the tibial muscle decreased. When registering electromyograms from the cambaloid muscle, there was a tendency to a decrease in activity in tests with fixation of knee joints.

Conclusions

At restriction of knee joint mobility the system of balance regulation improves due to activation of vestibular and proprioceptive afferent systems.



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