The psoas, no hip flexor in the Active Straight Leg Raise (ASLR)?
Hu Hai1,2, OG Meijer1, PW Hodges3, SM Bruijn1, JH van Dieën1

1. Research Institute MOVE, VU University, Amsterdam, The Netherlands
2. Zhongshan Hospital, Xiamen University, Xiamen, P.R. China
3. Centre of Clinical Research Excellence in Spinal Pain, Injury and Health, School of Rehabilitation Sciences, The University of Queensland, Brisbane, Australia

e-mail: Hai Hu, h.hu@fbw.vu.nl

AIM: To assess the psoas function during the Active Straight Leg Raise (ASLR), determine whether during hip flexion the psoas always has the same function as the iliacus, and whether the psoas affects the hip more than the lumbar spine.

METHODS: 17 healthy women (20-40 years old) performed ASLR, with the right and the left leg (“Side”), and without or with weight added above the ankle (“Weight”). Fine wire EMG was registered of the psoas and the iliacus, and surface EMG was used for activity of the rectus femoris and the adductor longus, all on the right side. Movements of the leg were registered with active markers and a camera system (OPTOTRAK).

RESULTS: During ipsilateral ASLR, all muscles studied were active, while only psoas was active during contralateral ASLR. Muscles were activated before ipsilateral movement onset, the iliacus, rectus femoris, and adductor longus largely at the same time, before the psoas. There was no significant difference between the amplitudes of ipsilateral and contralateral psoas activity, or between ipsilateral and contralateral onset times of the psoas. Nor was there a significant interaction between Side and Weight for the psoas.

CONCLUSION: During ASLR, ipsilateral psoas activity is consistent with the psoas being a hip flexor. However, contralateral activity is not and suggests that the psoas is bilaterally recruited to stabilize the lumbar spine, probably in the frontal plane.

Figure 1. EMG (mV) of the psoas, iliacus, rectus femoris, and adductor longus, during contralateral and ipsilateral ASLR without (grey) or with (black) weight added. Error bars represent standard deviations.

Figure 2: a. Representative example of EMG (mV, right vertical axis, black) and leg movement (m, left vertical axis, grey) during ASLR; b. Greater temporal resolution of the onset of EMG (black vertical lines) and leg movement (grey vertical lines).