• Category of presentation

Biomechanics, Motor control

• Title of Abstract

Psoas function in the active straight leg raise test?

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• Purpose

The aim of the present study was to investigate trunk and hip muscle activity during the Active Straight Leg Raise (ASLR) and during gait, and how it changes with a pelvic belt.

• Relevance

Women with Pregnancy-related Pelvic girdle Pain, or athletes with groin pain, may have trouble with hip flexion in functional activities such as gait and in the ASLR, for which a pelvic belt can be beneficial. How the hip flexion problems emerge, or how the belt works, remains insufficiently understood. Hip flexion may challenge stability of the SI joints due to the action of the hip flexor muscles on the ilium.

• Methods

Healthy nulligravidae (N = 17) performed the ASLR, and walked on a treadmill at increasing speeds, without and with a belt. Fine-wire Electromyography (EMG) was used to record activity of the mm. psoas, iliacus, and transversus abdominis, while other hip and trunk muscles were recorded with surface EMG.

• Results

In ASLR, all muscles were active. In both tasks, transverse and oblique abdominal muscles were less active with the belt. In ASLR, there was more activity of the contralateral m. biceps femoris, and in treadmill walking of the m gluteus maximus in conditions with a belt.

• Conclusions
For our interpretation, we take our starting point in the fact that hip flexors exert a forward rotating torque on the ilium. Apparently, the abdominal wall was active to prevent such forward rotation. If transverse and oblique abdominal muscles press the ilia against the sacrum (Snijders' "force closure"), the pelvis may move as one unit in the sagittal plane, and also contralateral hip extensor activity will stabilize the ipsilateral ilium. The fact that transverse and oblique abdominal muscles were less active in conditions with a pelvic belt, suggests that the belt provides such "force closure", thus confirming Snijders' theory.

- **Implications**

The present findings support the hypothesized role of transversus abdominus in stabilization of the SI joints and illustrate the mechanism of action of the pelvic belt. These findings thus provide a foundation for interventions such as training of transversus abdominus and use of a pelvic belt in patients with pelvic girdle pain.

- **Key words**

Pelvic pain, Hip flexion, Fine wire EMG, Lumbar spine stability, Active straight leg raise