

Effects of experimentally induced pain of the plantar soles on centre of foot pressure displacements during unperturbed upright stance

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Background: Although impaired balance control during quiet standing has repeatedly been reported in persons suffering from foot pain, a better understanding of the effect of foot pain on unperturbed postural control is needed in order to propose and implement efficient podiatry treatments/interventions into clinical practice. The present study was hence designed to address this issue.

Methods: Ten young healthy adults were asked to stand upright, eyes closed, as still as possible in three experimental conditions: (1) a no-pain condition, (2) a condition when a painful stimulation was applied to the plantar surfaces of both feet, and (3) a condition in which painful stimulation was applied to another body part, the palms of both hands. The centre of foot pressure displacements was recorded using a force platform.

Findings: For the same perceived intensity of the pain, the severe painful stimulation applied to the plantar surfaces of both feet increased centre of foot pressure displacements, whereas the severe painful stimulation applied to the palms of both hands did not.

Interpretation: These results reveal the deleterious effect of experimentally induced pain on the plantar soles on unperturbed bipedal postural control. At this point, it is conceivable that these effects of experimental pain could generalise to the effects of pain in patients. Accordingly, the present findings suggest that clinical and/or instrumental interventions designed to mitigate pain in patients suffering from plantar foot pain (e.g., podiatry treatments/interventions) could improve postural control.