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Impact of a thin plantar orthopaedic insert on posture and locomotion

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INTRODUCTION

EMI® (Medio-Intern Element):
- Podiatrist tool included in insoles
- Correction of postural deficiency:
  Contralateral effect of a 3 mm high EMI® on ML displacement of the CoP of healthy participants
- Effect on Eye convergence

=> Lack of evaluation
=> Only on static tasks

AIM AND HYPOTHESIS

Aim: Evaluate the effect of the EMI® on posture and locomotion
Hypothesis: effect of EMI® on ML and AP axis and on Ellipse surface

DESIGN AND ANALYSIS

- Participants: 19 healthy volunteers (9♂, 10♀, 27.05 yrs (±4.24))
- EMI® conditions: control (without), under left foot, under right foot

Static (Force plate ATMI®)

- Conditions:
  - Feet: parallel and 30° angle
  - Eyes: open and close

Analysis:
  CoP displacement on ML and AP axis :
  - Average position: BTVAp, BTVML
  - Between trials within subject variability: BTVAP, BTVML
  - Within trial within subject variability

Ellipse Area

Locomotion (Vicon®)

- Design based on Podokinetic after rotation (PKAR) protocol (30’ of walking stimulation)
- Conditions:
  - Eyes: open and close
  - Trajectory: straight, turn left 90°, turn right 90°

Analysis:
  Comparison between the difference in final orientation of locomotion with/without vision, with a EMI® and without a EMI®
  - Difference of final orientation

RESULTS

STATIC:

Only significant effects on feet position, eye condition and interaction between eye and feet position.
No significant effect of EMI®

LOCOMOTION:

No significant effect of EMI® on the final orientation of the walking

CONCLUSION AND FUTURE WORKS

Our protocol, involving healthy participants, was not able to show significant effect of EMI® on posture and locomotion
Feet positions has significant effects on posture: clinical activities have to be standardized to be able to compare CoP movement.

Future works:
- Evaluate population with foot postural deficiency:
  More effect of EMI® on eye vergence on a population with foot postural deficiency
- Normalize the evaluation of foot postural deficiency:
  No standardized procedure (compare foam effect on CoP with Depron®)

BIBLIOGRAPHY