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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 participants1
- Effect on Eye convergence2

=> 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: ML AP
- Between trials within subject variability: BTV<sub>AP</sub>, BTV<sub>ML</sub>
- Within trial within subject variability

Ellipse Area

● Locomotion (Vicon®)
  Design based on Podokinetic after rotation (PKAR) protocol3,4 (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®

RESULTS

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

Results of the 4 ways repeated measures ANOVA (EYExFOOTxEMIxEMIside)
Significant effects are represented as well as their size effect ($\eta^2_p$)

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 deficiency2
- Normalize the evaluation of foot postural deficiency:
  No standardized procedure (compare foam effect on CoP with Depron®)

BIBLIOGRAPHY