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®)**

<table>
<thead>
<tr>
<th>Conditions</th>
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</thead>
<tbody>
<tr>
<td>Feet: parallel and 30° angle</td>
<td></td>
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<tr>
<td>Eyes: open and close</td>
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</tbody>
</table>

Analysis:
CoP displacement on ML and AP axis:
- Average position: $ML_{AP}$
- Between trials within subject variability: $BTV_{ML}$, $BTV_{AP}$
- Within trial within subject variability

Ellipse Area

**Locomotion (Vicon®)**

Design based on Podokinetic after rotation (PKAR) protocol (30’ of walking stimulation)

<table>
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<tbody>
<tr>
<td>Eyes: open and close</td>
<td></td>
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<tr>
<td>Trajectory: straight, turn left 90°, turn right 90°</td>
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</tbody>
</table>

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

**BIBLIOGRAPHY**