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Evaluation of combined knee braces and foot orthoses treatment modalities on medial knee osteoarthritis

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EVALUATION OF COMBINED KNEE BRACES AND FOOT ORTHOSES

TREATMENT MODALITIES ON MEDIAL KNEE OSTEOARTHRITIS

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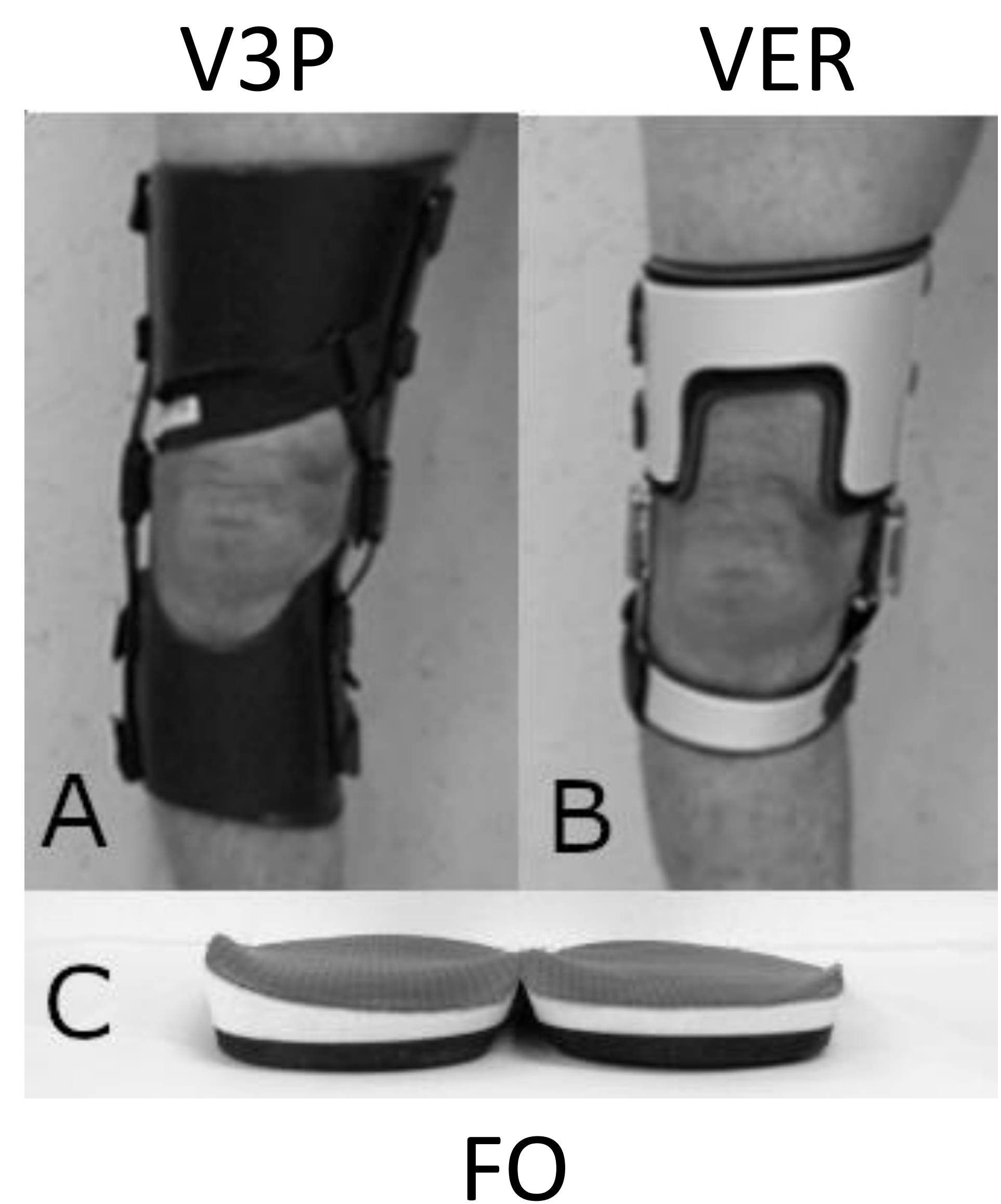


INTRODUCTION

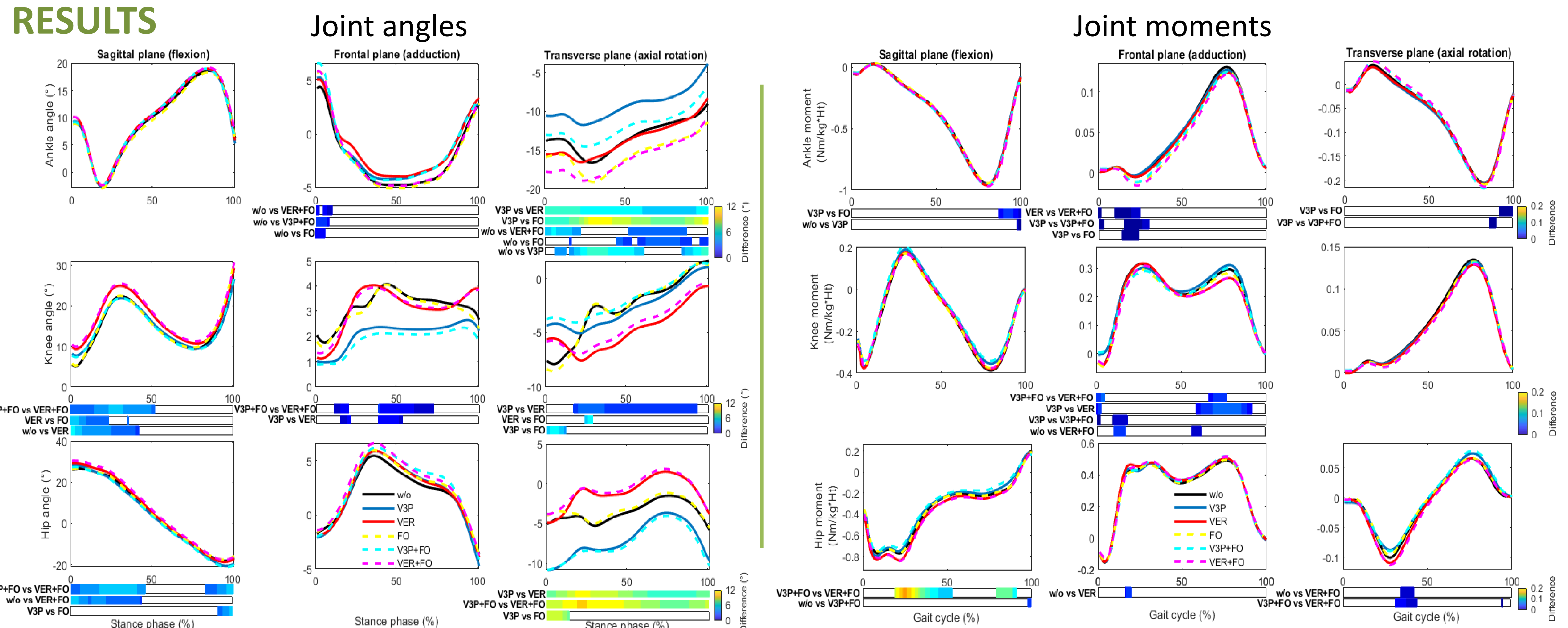
- Valgus knee braces (V3P) and lateral wedge foot orthoses (FO) are two common interventions for the treatment of medial knee osteoarthritis (KOA).
- Both interventions aim to reduce pain and the knee adduction moment (KAM) of medial KOA patients by shifting the center of pressure laterally.
- Recent studies suggest that their combined use can further reduce KAM [1-2].
- A new knee brace inducing valgus and external rotation as the leg extends (VER) showed biomechanical and functional benefits compared to other braces [3].
- **The objective was to evaluate gait with isolated and combined orthotic treatments in KOA patients.**

METHODS

- 10 patients with medial KOA (59±5 years, 1.68±0.06 m and 78.8±14.7 kg)
- Lower limb kinematics and joint moments were measured during stance.
- Pain and comfort visual analogue scores (VAS) were provided after trials.
- Six orthotic conditions were assessed: w/o, V3P, VER, FO, V3P+FO, VER+FO.
- Ten repetitions were achieved for each condition where gait speed was controlled.
- Joint angles and joint moments were contrasted with 1D statistical parametric mapping (SPM).
- A RM-ANOVA was conducted on pain and comfort between orthotic conditions.



RESULTS



- The VER brace significantly reduced the KAM and allowed more knee flexion both in isolation and in combination to FO compared to the V3P brace or without treatment.
- Pain relief was not significant with the different orthotic treatment modalities.
- The V3P-brace and combined treatment with either brace significantly increased the discomfort level ($P = 0.001$), whereas the VER-brace or FO in isolation did not induce significant discomfort.

CONCLUSION

- The combined treatment enhanced the biomechanical effects for the V3P brace.
- However, the VER brace showed similar effectiveness in isolation or in combination to FO.
- The VER-brace maintained comfort, which could improve long-term compliance to treatment.

REFERENCES

- [1] Moyer et al. (2013) Arch Phys Med Rehabil. 94, 103-112
- [2] Jafarnejadgero et al. (2018) Gait Posture. 59, 104-110
- [3] Robert-Lachaine et al. (2020) J Orthop Res 38, 2262-2271

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