Genu Arthro

Functional tests

Major Findings

With Genu Arthro (Fantini Pagani et al., 2010)

→ Stair climbing is faster
19.5% faster (4° valgus), 18.7% faster (neutral)

→ No significant changes during 6 minute walk test.

With Genu Arthro (GA) compared to MOS Genu (MOS) and wearing no orthosis: (Kutzner et al., 2011)

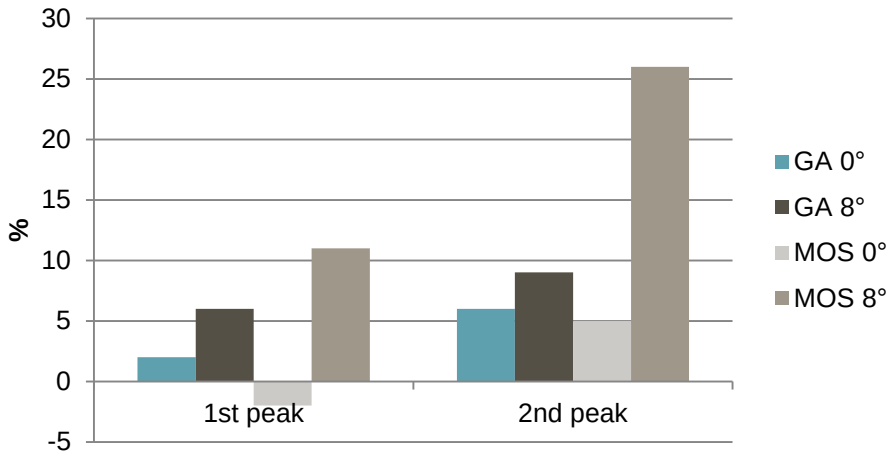
→ Stair ascent:

GA (0°, 8° valgus):	Fmed: 2-9% lower
MOS (0°, 8° valgus):	Fmed: -2% higher - 26% lower

→ Stair descent:

GA (0°, 8° valgus):	Fmed:	5-7% lower
	Fz:	3-7% lower
MOS (0°, 8° valgus):	Fmed:	2-24% lower
	Fz	6-16% lower

Reduction of the medial force (Fmed) during stair ascending (orthosis compared to wearing no orthosis)



Kutzner et al., 2011.

Clinical Relevance

Osteoarthritis (OA) is the most common joint disease, associated with pain and loss of mobility. Besides surgical treatments, several conservative methods, such as lateral shoe wedges and valgus bracing (such as Genu Arthro) are common to reduce the axial tibial force and/or to shift it laterally. Reduced loading of the affected compartment is related to pain reduction and improved function and may thus delay the need for joint replacement. (Kutzner et al., 2011)

Stair-climbing and walk tests are tasks widely used to evaluate functional capacities and quality of life. (Harada et al., 1999; Kirkley et al., 1999)

Summary

Compared to wearing no orthosis, stair climbing is 19.5% (4° valgus) and 18.7% faster (neutral) with Genu Arthro. (Fantini Pagani et al., 2010)

Kutzner et al. (2011) analysed the medial and vertical force (Fmed and Fz) during stair ascent as well as descent with 2 orthoses. 7 of 8 results for Fmed showed decreases while ascending stairs. Genu Arthro improved by 2-9%. The highest reduction was reported for MOS Genu (8° valgus). In descending stairs, decreases were reported for Fmed and Fz. GA showed slight reductions in Fmed (5-7%) and Fz (3-7%). Greater improvements were achieved by MOS with increases between 2-24% (Fmed) and 6-16% (Fz). Discomfort was reported when walking with the MOS brace in 8° valgus. Since the chosen valgus settings of 8°with the MOS brace would probably not have been tolerated for a long duration by the subjects, medial load reductions of more than 25% cannot be expected permanently.

During a 6 minute walk test, no significant changes were reported (Fantini Pagani et al., 2010).

References of summarized studies

Fantini Pagani CH, Böhle C, Potthast W, Brüggemann G-P (2010). Short-Term Effects of a Dedicated Knee Orthosis on Knee Adduction Moment, Pain, and Function in Patients With Osteoarthritis. Arch Phys Med Rehabil; 91:1936-41.

Kutzner I, Kuther S, Heinlein B, Dymke J, Bender A, Halder AM, Bergmann G (2011). The effect of valgus braces on medial compartment load of the knee joint– in vivo load measurements in three subjects. Journal of Biomechanics; 44: 1354–1360.

Other References

Harada ND, Chiu V, Stewart AL (1999). Mobility-related function in older adults: assessment with a six-minute walk test. Arch Phys Med Rehabil; 80:837-41.

Kirkley A, Webster-Bogaert S, Litchfield R, et al (1999). The effect of bracing on varus gonarthrosis. J Bone Joint Surg Am; 81:539-48.