

Abstract

The effect of ankle-foot orthoses on moments about the knee in diplegic cerebral palsy

Background: There is little reported information on the effect of Ankle-Foot Orthoses (AFOs) on kinetic parameters in spastic diplegic cerebral palsy (SDCP) children who walk with a Crouch Gait. This project aimed to assess the effect of AFOs on external moments about the knee in stance compared to barefoot (BF) walking in Crouch Gait.

Method: A retrospective analysis yielded 37 patients (45 walks) with SDCP and bilateral conventional AFO use, who had undergone gait analysis BF and with AFOs. The data set was sorted by the degree of BF mid-stance knee flexion (MSKF). Hyper-extenders (MSKF = $< 5^\circ$) were eliminated and remaining limbs sub-divided into: More-Crouched (MC), and Less-Crouched (LC). The sum of the stance knee moments was then calculated for each group and AFO effectiveness assessed using the "Gait Deviation Index" (GDI).

Results: A reduction in the sum of the stance knee moments with AFO use was associated with a decrease in MSKF flexion (LC: R = 0.51, MC: R = 0.82) and an improvement in the GDI (LC: R = 0.48, MC: R=0.76).

Conclusion: Effective AFOs that successfully reduce external moments acting about the knee are associated with a reduced degree of crouch and an improvement in gait as measured by the GDI.

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