Comparison of Foot Elevation Orthosis and Conventional AFO in Hemiplegic Gait - Preliminary Study

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Objective

Hemiplegic patients need an orthosis in their gait, but many patients seldom wear it. The purpose of this study is to compare the function of the Elevate™ Drop Foot Brace (EDFB) which is an easy-to-wear and affordable brace and conventional plastic AFO in hemiplegia.

Methods

Twenty-six hemiplegic patients, 63.6 ± 14.3 years old and 11.3 ± 09.1 months after brain lesion, took part in this study. Seven of them were excluded because they had errors in the measurements due to the cane. EDFB makes ankle dorsiflexion during swing phase by connecting threads on patient's own shoes.

We attached G-sensor®(BTS S.P.A, Italy) to the L5 spinous process area and measured gait parameters on the level ground; 10 m walking time(s), Cadence(steps/min), Speed(m/s), Duration(s), Gait cycle duration(s), Stride length(m), Swing phase(% cycle) and Stance phase(% cycle) were measured without orthosis, with plastic AFO, and with Elevation orthosis®. The statistical method is the Repeated ANOVA.

Results

The order of the lengthening of the stride length, the shortening of the 10m Walking time(s), and the number of Cadence (step / min) are shown as elevation brace, AFO, and without orthosis. Balance of Gait cycle duration and balance between Stance phase and Swing phase is in the order of Elevation brace, AFO, without orthosis. The left and right step lengths(%) are longer in the order of without orthosis, AFO, then elevation, and the duration steps are less in order of AFO, elevation, and without orthosis. ($P < 0.05$).

Conclusion

Elevation orthosis may increase gait efficiency in hemiplegic patients with dorsiflexion weakness. It can be a useful orthosis for gait training in hemiplegic patients.