PATHOKINESIOLOGY LABORATORY
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ABSTRACTS FROM CONFERENCE PRESENTATIONS (2003 – 2005)

STROKE

Clinical Indications for AFO Prescription in Individuals Post CVA. Eberly VJ, Weiss WB, Mulroy SJ, Newsam CJ, Gronley JK, Perry J. Combined Sections Meeting of the American Physical Therapy Association: February 2005, New Orleans, LA

Purpose/Hypothesis

To develop clinical criteria for prescribing the most effective orthoses to improve walking ability for survivors of a cerebrovascular accident (CVA).

Number of subjects

Thirty-nine subjects at least 6 months post CVA (mean of 29 months), with a mean age of 57 years who were able to ambulate at least six meters at a self selected speed not greater than 60 meters/minute were studied. The subjects included 26 males and 13 females, 24 who had left-sided lesions and 15 with right-sided lesions.

Materials/methods

Subjects walked in four conditions; in shoes only and three polypropylene ankle-foot orthosis (AFO) designs: dorsi assist/dorsi stop (DA/DS), plantar stop (PS) and rigid (R). Stride characteristics were recorded using compression closing switches taped to the bottom of each shoe as subjects walked across a 6-meter walkway. Clinical measures of Upright Motor Control, Berg Balance Scale (BBS), Fugyl-Meyer (proprioception portion), and PROM using a goniometer were recorded for each subject. Isometric strength of the dorsiflexors and plantar flexors was collected using a LIDO isokinetic dynamometer. Spasticity was assessed by the duration of the soleus muscle activity recorded using a five-second quick stretch manuever. Subjects were grouped according to the orthosis in which their velocity was greatest. A stepwise discriminant analysis of variance was performed to determine if any clinical measures were predictive of walking performance in the three AFOs.

Results

Six subjects walked fastest in the DA/DS AFO (mean of 37% of normal vs 31% in shoes), 18 subjects walked fastest in the PS AFO (mean of 41% of normal vs 36% in shoes) and 15 in the R AFO (mean of 31% of normal vs 25% in shoes). Score on the BBS was the only clinical measure that successfully differentiated subjects that would walk better in the PS or R AFO. Subjects who walked fastest in the PS AFO had the highest BBS score (47.5/56) and those who walked fastest in the R AFO had the lowest

BBS score (36.9/56). Subjects who walked fastest in the DA/DS AFO had an intermediate BBS score of 40.1/56. There was a tendency for the R AFO to restrict velocity compared to shoes only in the subjects who walked faster in either the PS or DA/DS AFO. Velocity in the PS or DA/DS AFOs (when not the fastest AFO) did not impede velocity compared to shoes only in any of the groups.

Conclusions

Scores on the BBS were a good indicator of effectiveness of an orthosis in our subjects post CVA. With a higher score on the BBS, consideration of an appropriate AFO would be a PS or a DA/DS AFO whereas with a lower score, a R or DA/DS AFO would be most appropriate. The BBS represents a composite picture of an individual's lower extremity and upright function as well as balance. A lower BBS score may indicate a greater need for control of dorsiflexion in stance.

Clinical Relevance

The Berg Balance Scale can be used to guide clinicians in their selection of appropriate AFOs for their patients post CVA.

Acknowledgement: Funded by National Institute of Disability and Rehabilitation Research #H133G000004