INTRODUCTION

Peripheral Neuropathy (PN) is reported among the risk factors for falls (Richardson and Hurvitz 1995). It is also reported that postural sway of individuals with peripheral neuropathy increases substantially (Horak, Dickstein et al. 2002) which is interpreted by many as the state of instability (Jeka 1997; Dickstein, Shupert et al. 2001) that may lead to falls. Ankle Foot Orthoses (AFOs) are commonly prescribed to control and limit movement at the ankle and knee, thus improving gait abnormalities in many patients, including those with PN (Rao and Aruin 1999). Therefore, we anticipated that the use of an AFO may reduce chances of falls by reducing postural sway.

METHODS AND PROCEDURE

A case of one patient with PN (72 yrs old, 177 cm, 75.4 kg) and 10 healthy young adults (age 24.2±1.7 yrs, height 166.9±10 cm and weight 74.6±18.4 kg) participated in the study. Biodex Balance System (Biodex Medical Systems, New York) was used for measurement. Three tests of Static Postural Stability (SPS), Dynamic Postural Stability (DPS) and Limits of Stability (LOS) where performed in a random order (Figure 1). Data was collected for 30 seconds in each trial and each trial was repeated three times. All tests were repeated for the patient participant of the study while wearing the AFO. A total of 120 trials were performed on the control population and 24 trials on the PN participant (12 with and 12 without AFO). Two way factorial analysis of variance was used to analyze the data.

RESULTS

Main factorial effect indicated significant difference in overall performance of LOS between healthy subjects and the PN participant (p=0.039). However, overall performance index in LOS
trials was not significantly affected by the use of AFO. In addition, the performance in DPS trials was significantly different between the control group and the PN participant (p=0.012). Similar to LOS trials, performance in DPS trials was not affected by the use of AFO significantly. In contrast to the LOS and DPS trials, during SPS tests, no significant differences were found between the performance of the PN participant and the control group (p>0.05). SPS trials were not also affected by the use of AFO.

**DISCUSSION**

Overall, our results indicated a significant difference between control subjects and PN participant, which is more obvious in dynamic tests and tests of limits of stability where substantial ankle movements are required during the test. However, the affect of the use of AFO was not significant in any of the tests and the difference between control and PN participant was not significant when the platform was static and no attempt was made to shift the center of mass (SPS trials). One potential reason could pertain to the large age difference between the control group and patient of this study. In addition, the observed changes may be associated with the small sample size. However, our results suggest that peripheral neuropathy may generally impact the dynamic control of balance and posture and use of an AFO may not significantly affect the user’s performance. Furthermore, our findings indicate discriminative quality of LOS and DPS measurements for test of postural control.

**SUMMARY**

In summary, the results demonstrate that use of an AFO does not provide better stability or postural control in this case. However, the PN patient showed a lower level of balance skills when compared to healthy adult population, particularly in dynamic tests. These results warrant further study on a larger sample.

**REFERENCES**


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