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Title

Effectiveness of an Evidence Based Amputee Rehabilitation Program

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Summary

This randomized control trial was designed to determine whether an evidence-based amputee rehabilitation program could improve the functional mobility of transtibial amputees. The 6-minute walk test and Amputee Mobility Predictor detected significant improvements over 8 weeks.

Introduction

Individuals who receive prosthesis are typically discharged from rehabilitation when they can walk 150 feet. Most do not progress beyond this level of function after discharge. The purpose of this project was to determine whether an evidence-based amputee rehabilitation program could improve the functional mobility of transtibial amputees who had already completed standard rehabilitation and prosthetic training. We hypothesized that the functional mobility of subjects receiving the exercise intervention would improve while the wait list control subjects would remain unchanged.

Methods

This study was a randomized clinical trial. Measurements were be made at baseline and at the end of the eight-week intervention by an individual blinded to group assignment. Outcome measures were the 6-Minute Walk Test2 and the Amputee Mobility Predictor1 with prosthesis (AMPPro) and without prosthesis (AMPnoPro). Higher AMP scores indicate better mobility. Subjects were randomly assigned to intervention or wait list control. The intervention had five components 1) cardiopulmonary endurance, 2) core strengthening and power, 3) balance and coordination, 4) weight bearing and stance control, and 5) prosthetic gait training.3,4 Subjects received the intervention 3 days a week for 8 weeks. A two group repeated measures analysis

of variance was used to compare the change in AMPPro, AMPnoPro and 6 Minute Walk scores of the intervention and control groups.

Results

Sixteen transtibial amputees completed the study. Mean age was 63.25 years, mean time since amputation was 8.1 years, 81.2% were male and 75% lost their limb because of PVD or DM. Subjects in the intervention and wait list control groups did not differ in their demographic characteristics and baseline measures. The AMPPro scores of the intervention group improved from 36.4 to 41.7, a 13% improvement in 8 weeks, while the control group scores were virtually unchanged 35.3 to 35.6 (p=.004). Similarly, the AMPnoPro scores of the intervention group improved from a mean of 23.2 to 27.1, while the control group scores moved from 24.7 to 25.0 (p=.04). The 6 Minute Walk test of the intervention group improved from a mean of 313.6 meters to 387.7 meters, a 19% improvement in 8 weeks, while the control group went from 262.6 meters to 268.8 meters (p=.04). In addition, when comparing the mean values for prosthetic functional classification levels, participants improved one functional level and therefore would qualify for higher functioning prosthetic components.

Conclusion

Even though the subjects enrolled in this study were many years post amputation, those who received 8 weeks of strengthening, endurance and balance exercises combined with gait training demonstrated significant improvement in mobility as measured by the AMP and by the 6 Minute Walk test. These findings suggest that individuals with limb loss may benefit from additional comprehensive rehabilitation after they have recovered from surgery and the conditions that lead to amputation. Because the wait list control subjects did not improve indicates that simply walking with the prosthesis is not sufficient to restore functional mobility. Comprehensive rehabilitation is required to maximize functional mobility in individuals who have undergone amputation. In addition, in some countries, the functional improvements by the subjects would qualify them prosthetic components that are identified as higher functioning by reimbursement agents.

References

1. Gailey, R, Roach, K, Applegate, B, Nash, M. The Amputee Mobility Predictor (AMP): An Instrument to Assess Determinants of the Lower Limb Amputee's Ability to Ambulate. Arch Phys Med Rehab 83(5): 613-627, 2002.

2. Butland R. Two-, six-, 12-minute walking tests in respiratory disease. Br Med J 1982; 284:283-284.

3. Gailey, R.S., Clark, C. R. Physical Therapy management of Adult Lower-Limb Amputees. In Atlas of Prosthetics: Surgical, Prosthetic, and Rehabilitation Principles. DG Smith, JH Bowker, J W Michael (3rd ed.). Mosby Company, 2004.

4. Yigeter K, SenerG, Erbahceci F, Bayar K, Ulger OG, AkdoganS A comparison of traditional prosthetic training versus proprioceptive neuromuscular facilitation resistive gait training with trans-femoral amputees. Prosthet Orthot Int 26(3):213-7,2002.