The Effects of Heel Lifts on Dynamic Measures of Gait and Static Posture in Individuals with Parkinson’s Disease

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**Recommended Citation**
Jusko, Elizabeth SPT; Roderos, Breanna SPT; Uno, Sarah SPT; and Hastings, Jennifer PT, PhD, "The Effects of Heel Lifts on Dynamic Measures of Gait and Static Posture in Individuals with Parkinson's Disease" (2020). *Physical Therapy Research Symposium*. 60.
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The Effects of Heel Lifts on Dynamic Measures of Gait and Static Posture in Individuals With Parkinson’s Disease
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INTRODUCTION
Abnormal posture and decreased step length are exaggerated in patients with Parkinson’s Disease (PD) increasing their risk for falls. Hastings et al (2018) proposed plantarflexion contractures contribute to the classic “stooped posture”. Hastings et al (2018) addressed this postural alignment through accommodating in-shoe heel lifts (HL), finding they significantly increased measures of upright postural alignment and perceived stability.

Purpose: Expand upon Hastings et al (2018) by investigating dynamic gait measures when in-shoe HLs are used as compared to when they are not used in individuals with PD.

METHODS

Static Gait Measures
Numeric analog perceived stability scale and sagittal posture photo analysis with and without heel lifts.

Dynamic Gait Measures
Activities-Specific Balance Confidence (ABC) scale, TUG test, video analysis of temporal gait parameters and the turning measurement by Dite and Temple (2002).

Protocol
• Data Session 1
  ◦ DF PROM measured and heel lift assigned based on severity.
  ◦ Outcome measures taken without then with heel lifts.
• Two week interim
  ◦ Participants kept track of heel lift use in log.
• Data Session 2
  ◦ Outcome measures taken with then without heel lifts.

RESULTS

Images 1 & 2. Images illustrate the finding of significant increase in head tilt angle (p = .03) in participants when utilizing insertable heel lifts (R image) than without (L image).

| Table 1. Adjust-a-Lift heel lift sizing. |
|---------------------------------|-----------------|-----------------|
| PROM | Height of Heel Lift (cm) |
| Positive to -4° | 0.5 |
| -5° to -9° | 0.9 |
| < -10° | 1.3 |

Table 2. Participant demographics (n = 17, 14 male and 3 female). Ambulatory with or without AD, sit/stand without assistance, and English speaking.

<table>
<thead>
<tr>
<th>Average</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>70</td>
</tr>
<tr>
<td>Years Since Diagnosis</td>
<td>5</td>
</tr>
<tr>
<td>Hoehn-Yahr Scale</td>
<td>1</td>
</tr>
<tr>
<td>DF PROM</td>
<td>0.86</td>
</tr>
<tr>
<td>Falls / Week</td>
<td>0.3</td>
</tr>
<tr>
<td>Freezing Episodes / Month</td>
<td>12.3</td>
</tr>
<tr>
<td>Days HL worn between sessions</td>
<td>13.4</td>
</tr>
<tr>
<td>Participation in Regular Exercise</td>
<td>100% of participants</td>
</tr>
<tr>
<td>Participation in Regular Stretching</td>
<td>70.6% of participants</td>
</tr>
</tbody>
</table>

DISCUSSION

• No significant difference was found for total TUG time, Perceived Stability or ABC scale scores with and without the heel lifts.
• DF ROM and ABC scale did not show significant correlation.
• Turn time significantly improved with in-shoe heel lifts (p = .002).
• Turn time correlated to overall balance confidence (r = -.802, p = .000).
• Overall balance confidence correlated to fall history (r = -.501, p = .041).

CONCLUSION

Accommodating PF contractures with an in-shoe HL significantly improves head tilt angle and decreases turn time compared to without HLs, and thereby can promote fall reduction in this population.