Cerebellar degeneration (CD) is a rare brain dysfunction that affects motor control. Ataxia is a common manifestation of CD, defined as the discoordination of the limbs or trunk. Interventions that have separately been found to be effective when treating ataxia are postural training, comprehensive physical therapy (PT) and weighted vest protocols.\(^\text{1,2,3,4}\)

While each of these treatments have individually been shown to decrease ataxia, they have not been used in combination.

**Purpose**

The purpose of this case report was to investigate a combined weighted vest protocol and comprehensive PT program for a 34-year-old with cerebellar degeneration.

**Case Description**

- The patient was a 34-year-old female who presented with severe ataxia and impaired mobility.
- The patient was previously in good health and worked at the hospital.
- The patient was admitted to the inpatient rehabilitation unit for intensive PT, occupational therapy, and speech therapy.
- A comprehensive PT program including strengthening, endurance and balance training was utilized.
- Additionally, the patient wore a weighted vest and used a weighted walker when participating in transfers, gait training, and functional tasks.
- Over 3 weeks, she was seen for 21 visits.
- The patient’s personal rehabilitation goal was to return home to her husband and 3-year-old son.

**Interventions**

<table>
<thead>
<tr>
<th>Week One</th>
<th>Week Two</th>
<th>Week Three</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed mobility</td>
<td>Performed with CGA, used of bed rails, and multiple sequencing cues</td>
<td>Performed with supervision and no use of bed rails</td>
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<tr>
<td>Transfers</td>
<td>Squat pivot w/ minimal assist of 2 and sit to stand in // bar w/ moderate assist of 2</td>
<td>Squat pivot w/ CGA and pt self using // bar to stand with FWW and stand step w/ minimal assist of 2</td>
</tr>
<tr>
<td>Therapeutic Exercise</td>
<td>LE strengthening and sitting balance with back support</td>
<td>LE strengthening, dynamic sitting balance and static standing balance in // bar w/ UE support</td>
</tr>
<tr>
<td>Family Education</td>
<td>Initial team meeting and discharge planning</td>
<td>Home Evaluation</td>
</tr>
<tr>
<td>Wheelchair mobility</td>
<td>LE+LE use w/ minimal assist over 150 ft and w/6 ft room</td>
<td>Supervision over even and uneven surfaces for 100 ft x3</td>
</tr>
<tr>
<td>Gait Training with weights*</td>
<td>50 ft to 60 ft w/ moderate assist of 2 w/ FWW, w/6 follow and seated rest breaks</td>
<td>60 ft to 100 ft w/ minimal assist of 2 w/ FWW and a w/6 follow</td>
</tr>
</tbody>
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*Weighted Vest Protocol: Progresively increased weighted vest from 0 to 30# and weight on walker from 0 to 15#

**Plan of Care Timeline**

- **Week One:** Presented to ED 3 times, Extensive testing was inconclusive. Admitted with possible do of experiments.
- **Week Two:** Transferred to larger hospital for higher level of care. Patient returns to original hospital’s Inpatient Rehabilitation Unit with the diagnosis of spinocerebellar degeneration.
- **Week Three:** 30 pound weighted vest. The patient was followed by a physiatrist, nurse, a case worker, occupational therapists, speech therapists and physical therapists in the hospital’s inpatient rehabilitation program.

**Medical Management**

- **Week One:** Draft of plan.
- **Week Two:** 50 days after admission.
- **Week Three:** 4 days after admission.

**Physical Therapy Management**

- **Week One:** Acute care focused on increasing arousal and transfers from bed to chair.
- **Week Two:** A comprehensive physical therapy program included strength, balance, and endurance exercises. A weighted vest and walker were utilized during transfers, gait training and functional tasks.
- **Week Three:** Treatment focused on bed mobility, squat pivot transfers, ambulating with weighted vest/ walker with moderate assistance of 2.

**Discussion**

- Studies have investigated the use of weighted vest protocols and comprehensive PT programs separately but not in combination.
- After 3 weeks of a combined weighted vest protocol and comprehensive PT program, the patient showed gains in all areas of strength, balance, transfers and gait.
- The complexity of her medical condition limited her ability to meet her long-term PT goals of complete independence, however, she was able to return home to her husband and 3-year-old son at discharge.
- A limitation of this case report was that 6 different physical therapists treated this patient over the course of her stay.

**Conclusion**

- This patient appeared to make improvements in mobility after participating in strength, endurance and balance training and following the use of a weighted vest during functional tasks.
- The idiopathic cause of her condition made it difficult to anticipate the expected progression of her disease.
- Future studies should investigate the percent of body mass a weighted vest should be to have the most benefit for patients with CD.

**References**