Effect of Osteopathic Manipulative Treatment on Gait and Balance in Patients With Parkinson’s Disease

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Background

Parkinson’s Disease (PD):
- Second most common neurodegenerative disease.
- Pathophysiology is characterized by loss of dopamine in the basal ganglia affecting the neurotransmitters melanin and motor cortex.
- Common symptoms: tremor, rigidity, bradykinesia and postural instability.
- Falls in People with PD:
  - People with PD, are 2 times more likely to fall than people with other neurologic conditions and 3-4 times more likely to fall when compared to healthy older adults.
  - Risk factors associated with falls: history of falls, postural instability, gait freezing, leg weakness, and cognitive impairment.
- The Functional Reach (FR) Test distance (Figure 6) has demonstrated to be predictive of fall risk in elderly people.
- The Timed Up and Go (TUG) test includes a go-at-speed component and then walking at a leisurely, normal, and then returning to their chair and is used to measure basic mobility skills of elderly individuals or those with neurologic conditions.
- Osteopathic Manipulative Treatment (OMT) could potentially improve gait and balance in people with PD.
- OMT has shown to improve postural control in healthy older subjects.
- The effects of OMT on people with PD have previously shown a positive effect on gait kinematics.
- However, they did not examine static components of postural control, which are the most common causes of falls in PD.

Experimental Design and Methods

- Study type: Randomized controlled trial.
- Hypothesis: OMT will improve gait and balance in individuals with PD.
- Study outcomes: Timed Up and Go (TUG) test and Functional Reach (FR) Test (Figure 6).
- Experimental design: Individuals with PD and age matched healthy participants were randomly assigned to one of three treatment groups (Figure 1). The main outcomes were measured before and after receiving their designated treatment.
- All OMT and Sham OMT was performed by four certified Osteopathic Manipulative Medicine (OMM) specialists.

Participants

- PD Participants
  - Whole Body OMT: 13
  - Neck Down OMT: 13
  - Sham OMT: 13
  - Total Participants: 39
- Control Participants
  - Whole Body OMT: 7
  - Neck Down OMT: 7
  - Sham OMT: 6
  - Total Participants: 20
- Treatment Group Totals
  - Whole Body OMT: 20
  - Neck Down OMT: 20
  - Sham OMT: 19
  - Total Participants: 59

Results

- Analysis of variance was performed on the clinical data.
- The results showed:
  - A significant difference between the PD participants and the Control participants on FR (PD = 7.6 cm, C = 6.16 cm).
  - A significant improvement in the pre-treatment vs. post-treatment FR scores for individuals with PD participants. The pre-treatment change in FR for PD was 2.65 cm and for C was 1.47 cm (Figure 6).
  - A significant change between any of the treatment groups or between the pre and post-treatment FR scores.

- An expected PD participants had slower TUG times and could reach a shorter distance in the FR test compared to control subjects.
- The significant improvement in functional reach post-treatment could indicate a learning curve, as there was no significant difference between treatment groups.
- The results do not support our hypothesis as there was no statistical significance between any of the treatment groups for the outcomes measured.

- Participant fatigue could have been a significant factor for the results obtained as all testing was completed in the same day. It is also possible that the effect of an OMT session may not be fully achieved immediately after the treatment was received. More significant results may have been found if the re-assessment was done at a follow-up appointment instead of the same day.
- Other limitations of the current study:
  - Relatively small sample size.
  - Nearly half of the PD participants did not have an age matched control.
  - This was a single treatment session vs. multiple treatment sessions.
- This trial is still in data collection, as this only represents a subset of the data that will be collected.

Conclusion

The results do not support our hypothesis. As expected, PD participants had slower TUG times and could reach a shorter distance in the FR test compared to control subjects. The significant improvement in functional reach post-treatment could indicate a learning curve, as there was no significant difference between treatment groups. The results do not support our hypothesis as there was no statistical significance between any of the treatment groups for the outcomes measured.

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References