The Effect of Osteopathic Manipulative Treatment on Mobility and Activity in a Parkinson’s Disease Subject

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Introduction
Parkinson’s disease (PD) is the second most common progressive neurodegenerative movement disorder. The hallmark features include stiffness, bradykinesia and postural instability. People with this disease are more likely to suffer from falls due to these disease manifestations. Further, these people are less likely to participate in physical activity and have a decreased quality of life due to loss of balance and fear of falling.1,3 Our previous pilot study showed that OMT can improve balance and motor function in PD.4

Case
A 61 year old Hispanic male diagnosed with PD 17 years ago. The pharmacological treatment was levodopa/carbidopa/amantadine. The subject was previously naive to OMT.

Objective
To further the findings of the pilot study by examining the effect of OMT on activity, falls and quality of life in PD. The goal of the OMT protocol is to decrease musculoskeletal restrictions in an effort to improve activity level and decrease falls.

Hypothesis
OMT will increase activity, improve quality of life and decrease falls in PD. This case is based on one of our subjects in a study investigating the effects of OMT in PD.

Method
• The subject was screened and consented at the NYITCOM Academic Health Center and found to meet the inclusion criteria. A full medical history was taken and he was given a wrist device to track activity (FitBit Charge™)

Inclusion Criteria
1: Medically diagnosed with PD
2: Over the age of 40
3: Baseline MDS-UPDRS Part III score ≤ 36, SOT score of ≤ 75 and Mini-BESTest score < 19

Exclusion Criteria
1: Medically diagnosed with other neurological diseases or disorders
2: Age less than 40
3: Baseline MDS-UPDRS Part III score > 36, SOT score of ≥ 75 and Mini-BESTest score ≥ 19
4: Pregnant
5: Being unable to complete the assessment tools

• He then went through a 6-week protocol of bi-weekly OMT that was designed to decrease musculoskeletal restrictions. [Figure 1]
    - Week 7, 8 and 9 was the washout period. The subject received no treatment and was advised not to make any changes to his medication regimen. His final visit was after the washout period
    - Outcome measures were performed at week 1, 3, 6 and 10 shown in Table 1
    - The tools that were used for outcome measures include:
        - NeuroCom SMART Balance Master® Sensory Organization Test (SOT) for balance
        - Mini-Balance Evaluation Systems Test (Mini-BESTest) for balance and motor function
        - The Movement Disorder Society-United Parkinson’s Disease Rating Scale (MDS-UPDRS) for motor function
        - The PD Questionnaire-39 (PDQ-39) for quality of life
        - A wrist worn activity band, the FitBit™ Charge, for activity
        - A questionnaire for self-reporting falls (Fall Log)
    - Changes in repeated outcomes measures were calculated.

Case Results
• The PDQ-39 showed a 61.5% decrease, which shows a large perceived improvement in quality of life.
• Specifically the subject reported feeling less frightened of falling and a decreased need to be accompanied when going out.
• A meta-analysis of 22 studies of Deep Brain Stimulation (DBS) outcome conducted by the Movement Disorder Society showed the average improvement in PDQ-39 to be 34.5% ± 15.5%.
• UDPRS showed improvement in lower extremity rigidity and the ability to rise from a chair.
• In accordance with our pilot study, balance was shown to improve from week 1 to week 6 by a 13% increase in the Mini-BESTest and a 7% increase in the SOT.

Table 1. Outcome Measures

<table>
<thead>
<tr>
<th>Week 1 and 10</th>
<th>Week 3</th>
</tr>
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<tbody>
<tr>
<td>Fall Log</td>
<td>Fall Log</td>
</tr>
<tr>
<td>PDQ-39</td>
<td>SOT</td>
</tr>
<tr>
<td>MDS-UPDRS</td>
<td>Mini-BESTest</td>
</tr>
<tr>
<td>Average weekly steps from activity tracker (FitBit™)</td>
<td>Average weekly steps from activity tracker (FitBit™)</td>
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</tbody>
</table>

Results
• Falls Per Week
    - From week 1 to week 6, the subject reported a decrease in falls.

Figure 1: PARK-OMM Protocol

1: Suboccipital Release
2: Compression of the Fourth Ventricle (CV-4)
3: Supine Cervical Spine Articulation
4: Muscle Energy Technique (MET) of the Cervical Spine (Sidebending and Rotation)
5: Suboccipital Release
6: MET of the Radial Head
7: Circumduction of the Wrist Bilaterally
8: Sacroiliac Joint Gapping Bilaterally
9: MET of the Lower Extremity Adductor Muscles Bilaterally
10: Psoas MET Bilaterally
11: MET of the Hamstring Bilaterally
12: Bilaterally Ankle Articulatory Technique
13: MET to the Plantar and Dorsiflexion muscle of the Ankle Bilaterally
14: Seated Thoracic and Lumbar Spinal Articulation
15: Seated Active Myofascial Stretch to the Thoracic Spine (Sidebending and Rotation)

Figure 2: Falls per week measured by a self reported survey

Figure 3: Average number of daily steps for the subject measured by the FitBit™

Figure 4: Results from the PDQ-39 survey conducted pre and post the OMT protocol.

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