Impact of Nutrition on Quality of Life, Fatigue and Functional Mobility in MS; A Case Series Analysis

Lacey Bromley, PT, DPT, NCS, MSCS
Susan E Bennett, PT, DPT, EdD, NCS, MSCS

Background

• Dietary intervention is an alternative therapy proposed to have an effect on both etiology and progression of Multiple Sclerosis (MS).
• The process by which nutrients influence cell metabolism and inflammation in MS has been established on the molecular level, however studies examining the role of nutrition in MS are lacking.
• Anti-inflammatory diets, emphasizing plant-based nutrition, high in omega-3 fats, vegetables, fruits, beans and legumes, have been used to decrease the effects of inflammation in a variety of other disease states.
• These diets avoid many trademarks of the “American diet” which is high in beef, eggs and dairy as well as omega-6 fatty acid found in processed foods.
TLC diet

- The Therapeutic Lifestyle Change (TLC), created by the National Institute of Health (NIH) is a dietary guideline that emphasizes reducing dietary cholesterol, total fat, saturated fat, and trans fats. Complementing the diet with soluble fibers and fish while monitoring sodium intake is also suggested in the TLC protocol.7
- The TLC diet has many components of an anti-inflammatory diet and has been shown to enhance T cell-mediated immune functions.8

<table>
<thead>
<tr>
<th>Component</th>
<th>TLC Diet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total fat</td>
<td>25-35% of total calories*</td>
</tr>
<tr>
<td>Saturated fat</td>
<td>&lt;7% total calories</td>
</tr>
<tr>
<td>Polyunsaturated fat</td>
<td>Up to 10% of total calories</td>
</tr>
<tr>
<td>Monounsaturated fat</td>
<td>Up to 20% of total calories</td>
</tr>
<tr>
<td>Trans fat</td>
<td>Lower intake</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>50-60% of total calories</td>
</tr>
<tr>
<td>Dietary fiber</td>
<td>20-30 grams per day</td>
</tr>
<tr>
<td>Protein</td>
<td>15-25% of total calories</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>&lt;200 mg/day</td>
</tr>
<tr>
<td>Sodium</td>
<td>&lt;2,300 mg/day</td>
</tr>
<tr>
<td>Plant sterols/stanols</td>
<td>Add up to 2 grams per day</td>
</tr>
<tr>
<td>Soluble fiber</td>
<td>Increase 5-10 grams per day</td>
</tr>
<tr>
<td>Fish (fatty fish)</td>
<td>Include in weekly eating plan</td>
</tr>
</tbody>
</table>
AIM

• To assess the change of self-reported measures of quality of life, fatigue and functional mobility in a group of subjects living with MS who follow the TLC diet.

Methods

• Case series of 5 subjects with MS
• Over the age of 20 years with an EDSS between 2.0 and 6.5.
• Education regarding the TLC diet and sample menus are provided to each subject.
• Diet is monitored over 3 months using computer based dietary logs
• Diet is assessed using 3-day food diaries and the MEDFICTS questionnaire which is 87.5% sensitive in identifying adherence the TLC diet. 9
Measures Used

• Primary outcome measures:
  – Short Form -36 (SF-36)
  – Modified Fatigue Impact Scale (MFIS)
  – Twelve Item MS Walking Scale (MSWS-12)
  – Functional Assessment in MS (FAMS)
  – Fatigue Scale for Motor and Cognitive Functions (FSMC)
  – Multiple Sclerosis Impact Scale (MSIS-29)
• Assessment at baseline, 4, 8 and 12 weeks

Subject 1

• 61 year old female
• Rates overall health as good
• Weight 216.5 lbs
• Height 69 inches
  – BMI = 32
• After 2 months: 204.5 lbs
  – BMI= 30.2
• Carb/Fats/Protein
  – Baseline: 43/39/18
  – 2 months: 54/30/16
Subject 2

- 53 year old female
- Rates overall health as fair
- Weight 218 lbs
- Height 68 inches
  - BMI = 33.1
- After 2 month: 210 lbs
  - BMI = 31.9
- Carb/Fats/Protein
  - Baseline: 53/35/11
  - 2 months: 43/30/26

Subject 3

- 54 year old female
- Rates overall health as good
- Weight 102 lbs
- Height 61.75 inches
  - BMI = 18.8
- No change in weight
- Carb/Fats/Protein
  - Baseline: 42/37/21
  - 2 months: 44/31/25
Subject 5

- 50 year old female
- Rates overall health as Fair
- Weight: 300 lbs
- Height: 66 inches
  - BMI = 48.4
- After 2 months: 272 lbs
  - BMI = 43.9
- Carb/Fats/Protein
  - Baseline: 56/28/16
  - 2 months: 51/29/19

Subject 6

- 65 year old female
- Rates her overall health as fair
- Weight: 155lbs
- Height: 71 inches
  - BMI = 21.6
- After 2 months: 145lbs
  - BMI = 20.2
- Carb/Fats/Protein
  - Baseline: 21/57/22
  - 2 months: 45/36/19
Results

• This is an ongoing study; only preliminary results are reported – no statistical analysis has been run.

Self Reported measures

[Chart showing baseline and month 1 and 2 measurements for Total MFIS, MSWS-12 raw score, MSIS-29, and FSMC Total.]

Baseline 1 month 2 month
SF-36 Subscales

Functional Assessment in MS (FAMS)
Conclusions

- Adherence to the TLC diet was reasonable for the patients
- Online food records may prove very useful in sensitizing patients to their eating habits
- While adhering to the TLC diet all functional self report measures trended towards improvement

Strengths/Limitations

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple self reported measures assessed</td>
<td>Reporting bias</td>
</tr>
<tr>
<td>Online food entry for monitoring dietary habits</td>
<td>Food not supplied</td>
</tr>
<tr>
<td>Diet used has been shown to reduce inflammation</td>
<td>Small case series – no cause and effect can be established</td>
</tr>
<tr>
<td>Diet affordable and easy to adhere to</td>
<td>No objective measures used</td>
</tr>
<tr>
<td>First study to attempt to change overall diet in Multiple Sclerosis to assess functional measures</td>
<td>All confounders not accounted for (sleep scale included)</td>
</tr>
<tr>
<td></td>
<td>No control group</td>
</tr>
</tbody>
</table>
References