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

University at Buffalo
The State University of New York

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,[4] however studies examining the role of nutrition in MS are lacking.[5]
- 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.[5]
- 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.[6]

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]

TLC Diet

Table 1. Dietary Recommendations for TLC Diet

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

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

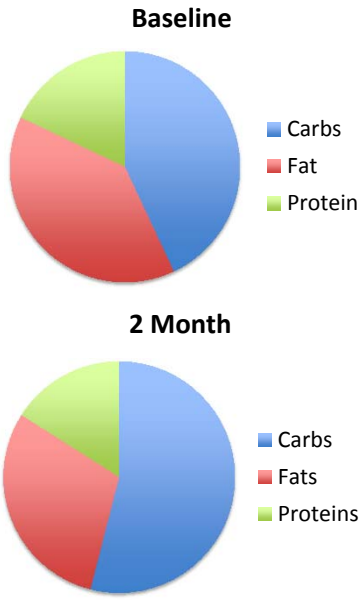
- Case series of 5 subjects with MS
- Over the age of 20 years with an EDSS between 2.0 and 6.5.
- Education regarding the TLC diet and sample menus are provided to each subject.
- Diet is monitored over 3 months using computer based dietary logs
- Diet is assessed using 3-day food diaries and the MEDFICTS 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

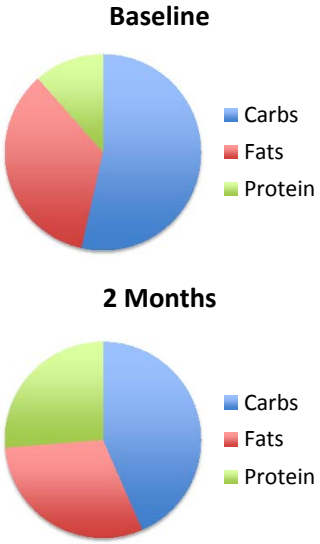
Subject 1

- 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



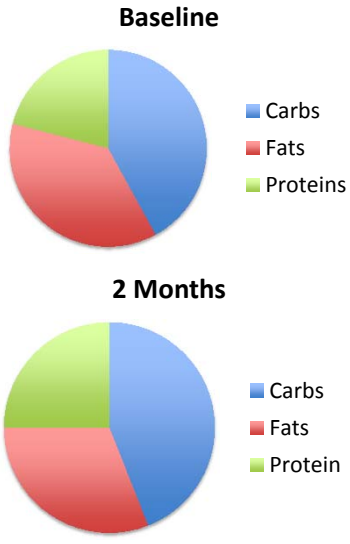
Subject 2

- 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



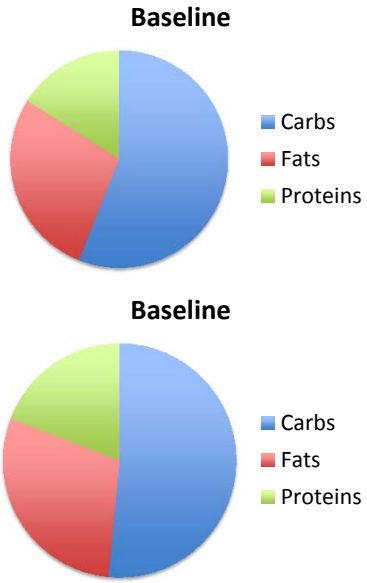
Subject 3

- 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



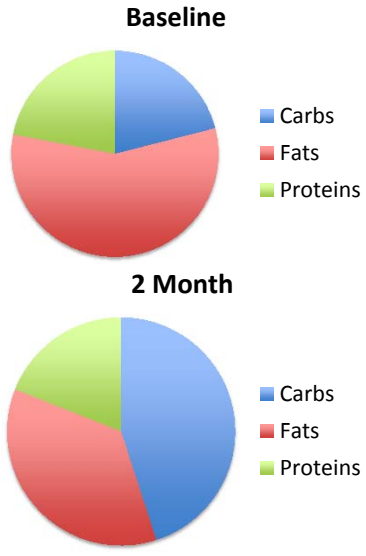
Subject 5

- 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

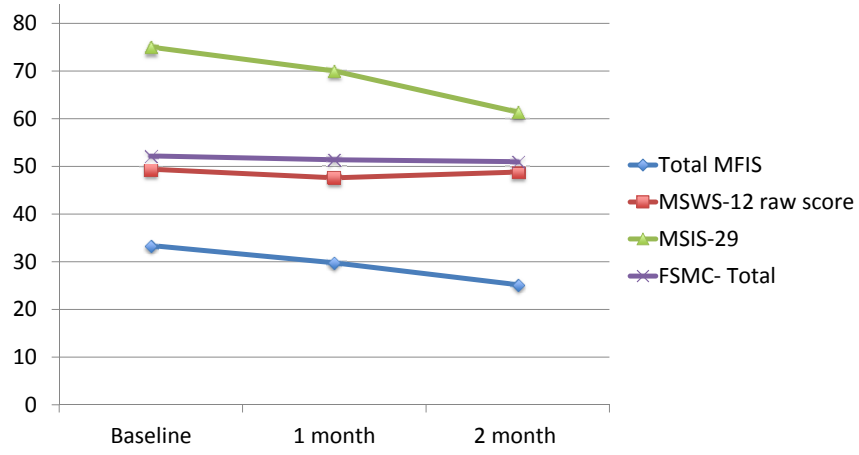
- 65 year old female
- Rates her overall health as fair
- Weight: 155lbs
- Height: 71 inches
  - BMI = 21.6
- After 2 months: 145lbs
  - BMI = 20.2
- Carb/Fats/Protein
  - Baseline: 21/57/22
  - 2 months: 45/36/19



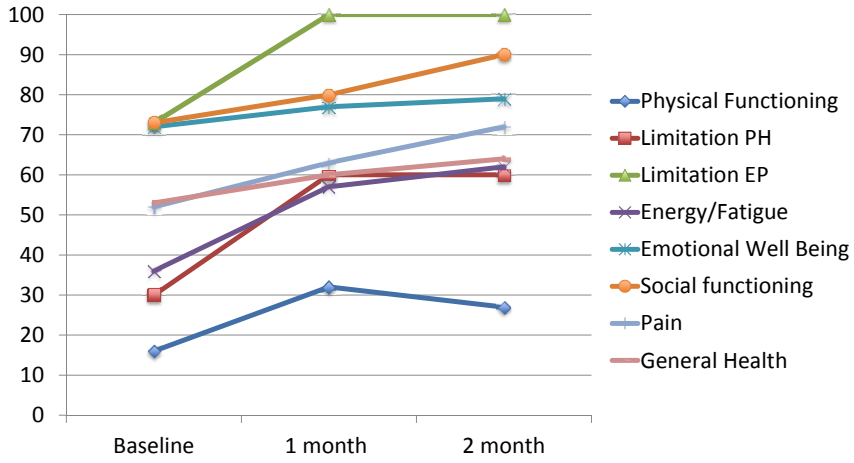
Results

- This is an on going study; only preliminary results are reported – no statistical analysis has been run.

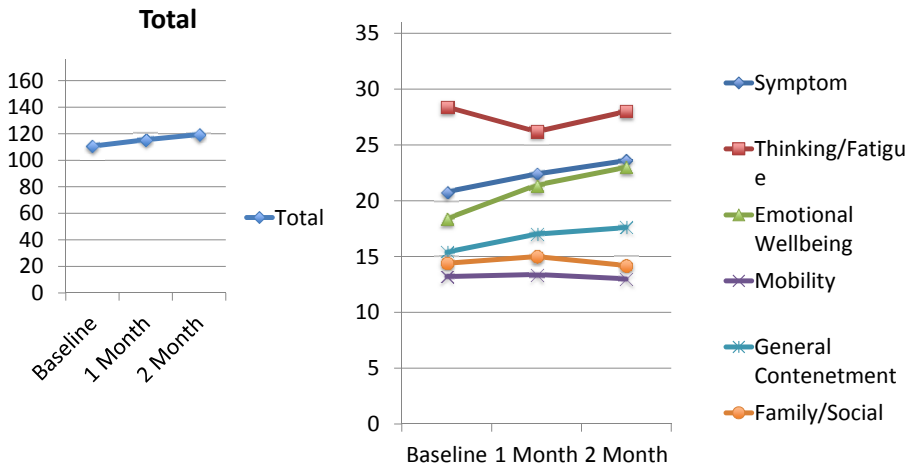
Self Reported measures



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

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

References

1. Embrey N. Multiple sclerosis: managing a complex neurological disease. Nursing standard (Royal College of Nursing (Great Britain) : 1987) 2014;29:49-58.
2. Utz KS, Hoog J, Wentrup A, et al. Patient preferences for disease-modifying drugs in multiple sclerosis therapy: a choice-based conjoint analysis. Therapeutic advances in neurological disorders 2014;7:263-75.
3. Weinstock-Guttman B. An update on new and emerging therapies for relapsing-remitting multiple sclerosis. The American journal of managed care 2013;19:s343-54.
4. Riccio P. The molecular basis of nutritional intervention in multiple sclerosis: a narrative review. Complementary therapies in medicine 2011;19:228-37.
5. Pauwels EK. The protective effect of the Mediterranean diet: focus on cancer and cardiovascular risk. Medical principles and practice : international journal of the Kuwait University, Health Science Centre 2011;20:103-11.
6. Maker-Clark G, Patel S. Integrative therapies for multiple sclerosis. Disease-a-month : DM 2013;59:290-301.
7. Executive Summary of The Third Report of The National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, And Treatment of High Blood Cholesterol In Adults (Adult Treatment Panel III). Jama 2001;285:2486-97.
8. Han SN, Leka LS, Lichtenstein AH, Ausman LM, Meydani SN. Effect of a therapeutic lifestyle change diet on immune functions of moderately hypercholesterolemic humans. Journal of lipid research 2003;44:2304-10.
9. Mochari H, Gao Q, Mosca L. Validation of the MEDFICTS dietary assessment questionnaire in a diverse population. Journal of the American Dietetic Association 2008;108:817-22.