Low Carbohydrate Dietary Intervention Improves Insulin, Hormonal Levels and Inflammatory Markers in Early Stage, Postmenopausal Breast Cancer Survivors

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Background

Obesity has been associated with decreased disease free survival and overall survival in postmenopausal breast cancer survivors. Proposed mechanisms for this finding include elevated estradiol levels, hyperinsulinemia, and increased inflammatory mediators. This feasibility study evaluated whether a low carbohydrate, calorie restricted dietary intervention could achieve weight loss and measurable metabolic changes in a group of obese postmenopausal breast cancer survivors.

Objectives

1. Determine if patients could comply with dietary intervention and achieve weight loss.
2. Evaluate efficacy of dietary intervention on decreasing serum hormone levels.
3. Evaluate efficacy of dietary intervention on decreasing serum insulin and inflammatory markers.

Methods

Protein Meal Product Replacements (0.5 g protein/lb actual body weight), <40 gm carbs, 800-1200 calories/day → Weekly Session with Health Coach → Medical Monitoring (brief physical exam) → Labs every 2 weeks x 12 weeks, then every month
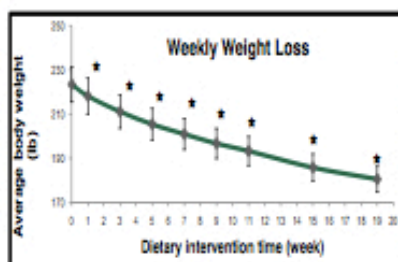
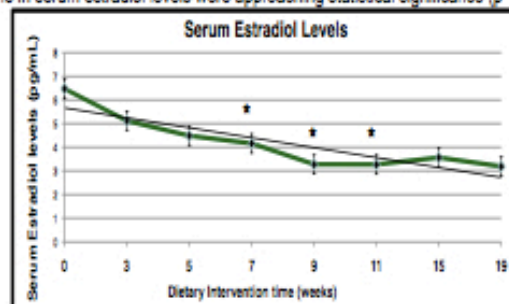| Eligibility Criteria |
| --- |
| Early Stage ER+ breast cancer survivor |
| Postmenopausal |
| BMI >28 |
| Completed surgery & adjuvant chemotherapy |
| No underlying inflammatory condition |
| No treatment for diabetes |

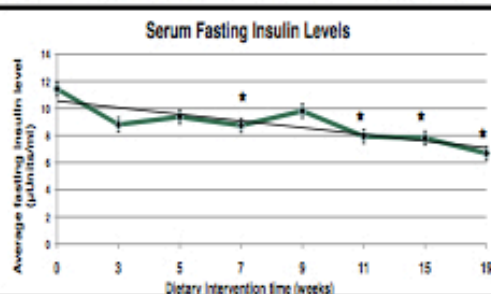| Demographics	
N= 24	Mean (range)
Age	57 years (42-68)
Weight (pre-diet)	220 lbs (171-300)
BMI (pre-diet)	37 (28-48.5)
Endocrine Therapy	AI (61%) Tamoxifen (35%)
Weight Loss Period	23 weeks (5-59)

Results

Weekly Weight Loss

The mean weight loss was 19.9% of total body weight, the equivalent of 43.7 pounds. Total body fat lost was 6.86%. Weight loss averaged 5.4 pounds in week one and 2.14 pounds per week in weeks 2-19.

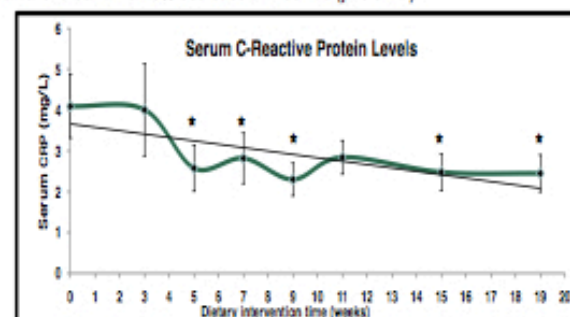Decline in serum estradiol levels were approaching statistical significance (p=0.056).

Serum Estradiol Levels

A rapid decline in fasting insulin level was seen with a 23% decline by Week 3 (p=0.0959), 26% by Week 7 (p=0.0139), and 42% by Week 19 (p=0.0071).

Serum Fasting Insulin Levels

Results (cont.)

A statistically significant improvement in the CRP level compared to baseline was also demonstrated with a 40% decrease at Week 19 (p=0.0272).

Serum C-Reactive Protein Levels

Conclusions

1. A low carbohydrate dietary intervention can successfully be implemented in a group of overweight breast cancer survivors to achieve significant amounts of weight loss.
2. A rapid and significant reduction in serum hormonal levels and serum inflammatory markers can be achieved with dietary intervention.
3. This feasibility study provides additional support for larger trials evaluating the role of carbohydrate restriction in cancer survivors.

References

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