Effects of Anti-inflammatory Foods on Hyperglycemia in Type-1 Diabetics

Primrose Martin, McNair Scholar & Psychology Major
Mentored by Dr. Michelle Chino, Department Chair of Environmental and Occupational Health

Introduction

Based on a case study administered by Dr. Charlotte Gerson, an IDDM patient referred to as R.H. reversed hyperglycemic symptoms within ten weeks while adhering to a diet of mainly vegetables and some low-glycemic index fruits. R.H. also ingested mineral supplements and underwent multiple coffee enemas each day (Gerson & Bishop, 2007, p. 56). This self-study hypothesizes that diet alone has a positive correlation coefficient with hyperglycemic blood glucose levels in type-1 diabetics (IDDM).

Conducting this self-study contributes information to the limited research and database of alternative methods for managing IDDM hyperglycemia, and provides candid documentation of the effects that food has on type-1 diabetes.

Materials, Methods and Data Analysis:

Objective: to understand whether eating certain types of food over others can improves rates of hyperglycemia in type 1 diabetics.

Controlled variable: "the participant", Primrose Martin, was a 21 year old diagnosed with diabetes for over a decade.

Independent variables: types of food allowed in the participant’s diet.

Dependent variables: subsequently recorded changes in BG levels.

Tools: OneTouch Ultra 2 blood glucose (BG) monitor used to test BG levels, a Jack La Lanne's Power Juicer for juicing fruits and vegetables during anti-inflammatory diet, a Medtronic MiniMed insulin pump, Apidra fast-acting injection insulin/ glulisine of rDNA origin, and organic foods purchased only at Whole Foods markets.

Methods Procedure: Test participant’s blood glucose during 8:00am, 11:00am, 3:00pm, 7:00pm, and 11:00pm, with excess blood glucose tests allowed to monitor suspected hyper-hypoglycemic episodes. Results were averaged every 3 days, giving a distribution of 20 sample means calculated for two sets of 30 days. Toiletries made of inorganic compounds/chemicals that may increase cellular inflammation were replaced with holistic alternatives to improve construct validity. No consumption of alcohol or use of non-prescription drugs took place throughout the experiments entirely.

- In the first 30 days, the participant ate meals that contained dairy, gluten, meat, and refined sugars. None of the foods prepared contained organic ingredients. Most meals were cooked and came pre-packaged. Of the foods cooked, many were prepared in the microwave. Uncooked foods came in the form of frozen fruit smoothies or protein shakes.

- The Gerson Therapy diet excludes all but organic fruits and vegetables. It prohibits ingestion of any food or drink that may cause significant inflammation, including: dairy products, meat, gluten, refined/unnrefined cane sugar, and alcohol or non prescription drugs. All produce was juiced 4 times daily, producing a liter of juice each meal and totaled around 8.8 lbs. of juice from produce consumed daily.

Noted experiences of the participant:

1. Physical reactions to inflammatory diet were: lethargy after eating accompanied by a raise in BG, gas, constipation, dry skin and acne, inability to sleep, sour smelling breath and noticeable body odor. On this diet, the participant would feel hungry within 2-3 hours of eating. Weight fluctuated between 147 and 149 pounds.

2. Physical reactions to anti-inflammatory diet were weight loss of 15.8 pounds within the first 17 days of organic juicing, complete disappearance of acne and dandruff, steadier sleep patterns, improvement of college exam scores that suggested a cognitive processes improvement, absence of excessive gas or bloating, and fecal excretion that occurred 2-3 times a day that suggested an overall intestinal health also improved. On this diet, the participant would often feel sated after eating a meal every 3-4 hours.

3. On the night of the 24th day of eating organic, participant was taken off of all medication due to severe hypoglycemia (low BG) episodes, and medication was not retaken for day 25, 26, or 27. On day 25, hypoglycemia occurred within the first 14 hours of being off medication, but stabilized on days 26 and 27. On day 28 the participant was put back on medication and experienced severe hypoglycemic episodes again. For the sake of health risks, the participant withdrew from the experiment on the night of the 28th day and strayed from the organic eating regimen to match carbohydrate demand of insulin pump's basal rate (a set hourly dose of insulin medication).

Conclusion

This self-study experiment questioned how much of an effect diet has on BG levels in IDDM patients. Its results show that an organic & anti-inflammatory diet low in carbohydrates may allow complete independence from insulin in IDDM patients. Findings support the hypothesis that diet can lower hyperglycemia rates and also induce hypoglycemia when paired with excess amounts of synthetic insulin.

Further Information

This study is limited in external validity due to lack of sample size, lack of time allotted for observation of effectiveness of anti-inflammatory diet, and possible experimenter bias errors in research due to the impossibility of conducting a double-blind test. However, testing BG at designated times during the diets, using a reliable tools or measuring my BG, injecting the same brand of insulin throughout both diets, and using the same insulin ratio amount for grams of carbohydrates eaten will help to increase internal validity.

Acknowledgments

I’d like to thank my mentor Dr. Michelle Chino, as well as all of the wonderful faculty and staff of the Ron McNair scholars program, for giving me the opportunity to conduct this study and contribute my experiences to a greater purpose. A special thanks to Ms. Terri Bernstein, who believed in my potential, and supported me when I needed it most.