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The Effects of daily diabetina tea consumption on glycosylated hemoglobin, fasting glucose and lipid levels, and body mass index in normoglycemic individuals

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Type 2 diabetes mellitus is a chronic disease responsible for high levels of morbidity and mortality in the United States, especially among some ethnic minority populations. Diabetina tea, a commercially-available herbal blend tea, is a well known herbal remedy for high blood sugar among Hispanic American diabetics. This study will examine the effect of twice-daily unsweetened Diabetina tea consumption over an 8 week period on glucose (sugar) and lipid (fat) metabolism. Potential effects of Diabetina tea consumption on glucose metabolism will be measured by glycosylated hemoglobin (HbA1c) and fasting glucose tests, while the potential effects of Diabetina tea consumption on lipid metabolism will be measured by fasting blood lipid levels, in addition to body mass index (BMI) and waist circumference (WC) measurements.

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Abstract

Type 2 diabetes mellitus is a chronic disease responsible for high levels of morbidity and mortality in the United States, especially among some ethnic minority populations. Diabetina tea, a commercially-available herbal blend tea, is a well known herbal remedy for high blood sugar among Hispanic American diabetics. The use of Diabetina has been cited in peer-reviewed journal articles, such as "The use of traditional plant medicines for non-insulin dependent diabetes mellitus in south Texas" (Noel, et al, 1997).

This study examines the effect of twice-daily unsweetened Diabetina tea consumption over an 8 week period on glucose (sugar) and lipid (fat) metabolism. Potential effects of Diabetina tea consumption on glucose metabolism will be measured by glycosylated hemoglobin (HbA1c) and fasting glucose tests, while the potential effects of Diabetina tea consumption on lipid metabolism will be measured by fasting blood lipid (fat) levels, in addition to body mass index (BMI) and waist circumference (WC) measurements.

Introduction

Medical anthropology is a dynamic and rapidly growing field that draws upon biological and cultural approaches to understand the causes of health and illness within societies (Brown, 1998). While the diversity of approaches within medical anthropology is vast, clinically-applied medical anthropology focuses on healthcare within biomedical settings such as hospitals and public health programs (Brown 1998). The impact of medical anthropology on biomedicine has been significant, creating new relationships between the fields of anthropology and epidemiology, nursing and nutrition.

Diabetes mellitus is a chronic disease caused by a deficiency in the production of insulin in the pancreas, or a lack of effectiveness of the insulin produced (CDC, 2005, WHO, 2007). This type of deficiency results in excessive concentrations of glucose in the blood, resulting in diseases of the kidneys, eyes, severe damage to blood vessels and nerves, as well as an increased risk of heart attack and stroke (WHO, 2007, NDEP, 2007). Diabetes has become one of the most common causes of death and disability in the United States, affecting 20.8 million Americans (NDEP, 2007). Globally, diabetes is responsible for 5% of deaths every year. Mortality rates are expected to increase by 50% within the next ten years (WHO, 2007). Worldwide, 80% of diabetics live in low and middle-income nations (World Health Organization, 2007).

The need for efficient, non-invasive and inexpensive treatment and prevention of diabetes and its pre-diabetic metabolic precursors is imperative. One alternative-medicine means of treating and preventing diabetes among Hispanic Americans is a popular herbal tea blend sold under the name Diabetina. Mexican Americans, the largest Hispanic subgroup, are 1.7 times as likely to be diagnosed with diabetes as non-Hispanic whites (CDC, 2005). While several of the herbal ingredients in Diabetina tea are known to have glucose-lowering biochemical properties (Noel et al., 1997), to date, no research on Diabetina tea and its potential to lower blood sugar levels when consumed in moderate, daily amounts, has been conducted.

Methods

Twenty healthy subjects between the ages of 18 and 34 are recruited from the university campus population. Prospective study participants are invited to attend a group (n = 10) orientation in the UNLV Nutrition, Metabolism and Anthropometry Lab. Only participants who drink any type of steeped or brewed tea 'only occasionally' (once per week or less), are asked to continue. Prospective participants are then asked to complete one final study-qualification step: a finger-stick blood sample for a glycosylated hemoglobin (HbA1c) test. HbA1c tests measure a person's average blood glucose over the preceding 8 to 12 weeks. Glycosylated hemoglobin is assayed using a bench top Bayer DCA 2000 Analyzer (CLIA-waived). Each participant's HbA1c test results become available in less than 5 minutes. Only study participants who have HbA1c blood sugar levels in the non-glucose impaired, healthy range (<6%), are allowed to continue in the study.

Once a participant's < 6.0% HbA1c level has been confirmed, they are scheduled to return to the lab within one week to provide a fasting (no food in the previous 10 hours) finger-stick blood sample. This second finger-stick sample consists of 100 microliters (0.1 cc; or approximately 5 or 6 drops) of whole blood, which is assayed for fasting blood glucose and blood lipids. Fasting glucose and lipid levels are assayed using an Abaxis Picolo Blood Chemistry Analyzer (CLIA-waived). Participants are also measured for standing height (rigid tape measure), weight (clinic-quality electronic scale) used to calculate body mass index (BMI), and waist circumference (WC) (flexible tape measure).

At this point, participants are randomly assigned to one of two groups: one group of 10 participants are provided with enough of Diabetina tea to consume two (and only two) cups (approximately 8 oz each) of unsweetened tea per day for the next 8 weeks; the other group of 10 participants receive enough uncaffeinated green tea to consume two (and only two) cups of unsweetened tea per day for 8 weeks. In this double-blind study, neither the researcher nor the participants know which tea they will receive. Participants are asked to refrain from all other tea consumption during the study and to note their daily (study) tea consumption -- including any missed days -- on a calendar.

After 8 weeks (study midpoint), participants are scheduled to return to the lab in a fasted state to repeat the HbA1c, fasting glucose/lipids tests and anthropometric (BMI/WC) tests/measurements. At this time, participants are once again provided with enough tea (either Diabetina or green tea -- whichever they did not receive during the previous 8 week period) to consume two cups of unsweetened tea per day for an additional 8 weeks.

Eight weeks later (16 weeks into the study) participants are once again scheduled to return to the lab in a fasted state to be tested/measured as before. Upon completion of the study, HbA1c data, fasting glucose and lipid levels will be analyzed to determine if HbA1c glucose levels, fasting glucose and/or lipid levels differed significantly after participants began consuming tea on a daily basis, and/or whether or not lab values differed significantly based on the type of tea being consumed. Participants' anthropometric data (BMI/WC) will be analyzed to determine if any significant weight loss/gain took place during the 16 weeks of participation. Statistical analysis will be performed using SPSS 11.5.

Discussion

Due to the 16-week time table of this research project, as well as the complexities which accompany conducting human research, no data has been analyzed to date. However, we are working proactively toward results.

The deliverable outcomes of this research include the publication of important medical and nutritional anthropological information in the form of peer-reviewed manuscripts in appropriate anthropological and scientific journals. Additionally, this research may potentially be presented at national conferences, such as those held by American Anthropological Association and the Society for Medical Anthropology.

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