

METABOLIC SYNDROME AND SOFT DRINK CONSUMPTION

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Metabolic syndrome is a cluster of symptoms that, if left untreated may develop into worse health conditions, such as diabetes. This study was done to investigate whether excess glucose and carbohydrates affect the risk of developing metabolic syndrome. We studied members of the Latino population, which are known to be at high-risk of diabetes. For the purpose of this study, we used revised ATP III criteria, consisting of high BMI, high blood pressure, elevated triglycerides, low high-density lipoprotein (HDL)-cholesterol levels, and high fasting glucose levels. Our analysis was conducted by obtaining the data from a blood test and answers to an assessment tool. Using the revised ATP III criteria, 18 of the 53 patients had metabolic syndrome. Of those with metabolic syndrome, all but one reported drinking soda. These same patients had the highest risk values in each of the five different metabolic syndrome criteria. Of the 53 patients, only 8 reported not drinking any soda. The 8 patients with no soda intake were in the normal ranges for their BMI, glucose levels, and blood pressure readings. Of these eight patients, four did little or no exercise resulting in high triglyceride levels. HDL levels appeared to be unaffected by the soda intake.

INTRODUCTION

Diabetes has significantly risen in the United States, but even more in the Latino community. Metabolic syndrome is a cluster of symptoms that are usually present before developing certain types of chronic diseases such as diabetes. Metabolic syndrome can be reversed before it has time to develop into an incurable disease like diabetes. Since the United States ranks number one in soda consumption, our research was designed to find out if the intake of superfluous glucose and empty calories affects the levels of the metabolic syndrome criteria. We used the revised ATP III criteria for this study. In order to be diagnosed with metabolic syndrome according to the ATP III criteria, you must have three of the following present: triglycerides ≥ 150 , HDL < 40 in males and < 50 in females, blood pressure $\geq 130/85$ mm HG or if on BP medication, glucose ≥ 110 , and a BMI of ≥ 30 . Having a waist circumference > 102 cm in men and > 88 cm in women is the fifth component of the criteria, but since we were not able to collect data on waist circumference, BMI was used instead.

METHOD

An assessment tool was created, which consisted of five questions on soda intake. The survey asked about the type of soda, the weekly and daily intake, and whether it was consumed alone or with food. These five questions were asked to every new patient who came in for a blood analysis and participated in the Buena Vida Program, which was created to minimize the incidence of chronic diseases

through early detection. Buena Vida offers a CHEM 24 blood test to the community. The test includes fasting glucose, lipid profile (cholesterol, triglycerides, HDL and LDL) minerals, plus liver and kidney functions. Data were obtained and analyzed. Basic information such as age, ethnicity, sex, and highest education level, were obtained. Blood analysis markers used included: triglyceride levels, fasting glucose levels, blood pressure (BP), HDL, and BMI was calculated. We also collected data on exercise or smoking habits, if the patient was currently on BP medication, if diagnosed with diabetes.

RESULTS

In all, we had 53 participants, with 29 females in these age categories: 10 young adults aged ≤ 30 years; 28 adults aged 31–59 years; and 14 adults aged ≥ 60 years. 51 were Latinos; 1 was White and 1 was American Indian. For education levels, 19 had \leq middle school education; 18 had a high school education and 14 had a college-level education.

We found 18 patients with diabetes and 18 were classified with metabolic syndrome, using the revised ATP III criteria. Out of the 18 with metabolic syndrome, 10 had diabetes as well.

In regard to soda consumption, 45 said they drank soda, with 14 daily drinkers, 17 drinking every other day and 14 drinking only once a week. Most remarkable, of those who said they drank any soda, 43 said they drank 1–3 cans of soda when they drank it and 31 said they drank soda with their meal.

Of the 18 patients with metabolic syndrome only one reported not drink-

ing any soda at all. Six reported drinking soda daily, of which one reported drinking 6+ daily, while the rest reported drinking 1–3 sodas. Seven reported drinking soda every other day and four reported that they drank soda only once a week. Diet and regular soda were equally popular among these 18 patients. The sodas were mainly consumed during meals, but a few outside of meals. Patients with metabolic syndrome had the highest levels of risk factors associated with metabolic syndrome. The highest triglycerides levels (300+) were found primarily in male adults with metabolic syndrome who drank a regular soda every other day with a meal or by itself and did little to no exercise. All patients who met the metabolic syndrome criteria for glucose had diabetes, the majority doing little to no exercise. Those with the highest glucose levels (200+) were females who drank a diet soda every other day with a meal. The lowest HDL levels had not much correlation to the amount of soda being consumed in either sex, but most of the patients with low HDL levels did little to no exercise. The patients considered obese or extremely obese also met metabolic syndrome criteria. Although males dominated in the high BMI scores, females held the highest values. Those who reported to drink soda daily held middle range values of

BMI while every other day drinkers had both high and low readings among the high risk values. The highest systolic readings (140+) were primarily from metabolic syndrome patients who drank a regular soda daily with a meal. Thirteen patients reported to be on BP medication.

Of the 8 of the 53 study participants who reported not drinking soda, all were adults around the age of 60. The majority were females. Half of these patients reported not doing exercise while the other half did. Also, only one reported smoking. These patients had normal BMI, glucose levels and blood pressure readings. Those whose triglycerides level fell under the metabolic syndrome criteria were those who did the least amount of exercise. It appeared that soda consumption had no apparent effect on HDL readings.

RECOMMENDATIONS

Although soda is considered to be “delicious” to all those that drink it, it is not recommended especially because of the mentioned health risks. Drinking soda can be a habit hard to change. First we must target the young population, toddlers to young adults, since it is they who consume the most soda. Approximately one fifth of 1–2 year olds,

already drink soda and will continue to do so for the remainder of their life unless the habit is changed. Fortunately, public schools have started doing their part by not offering sodas through their vending machines. Awareness is the first step to learning of the health risks of drinking soda for each individual. With awareness, the public can make healthier choices about soda intake and other contributing factors.

RESOURCES

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6. Wikipedia, *Metabolic Syndrome*. http://en.wikipedia.org/wiki/Metabolic_syndrome.
7. eMedExpert, *8 Reasons Why People Drink Soda & 16 Reason To Give Up Soda Drinking*. <http://www.emedexpert.com/tips/soft-drinks.shtml>.
8. The New York Times, Marian Burros and Melanie Warner *Bottlers Agree to a School Ban on Sweet Drinks*. <http://www.nytimes.com/2006/05/04/health/04soda.html>.