Do regular and diet soft drinks raise heart disease risk?

Rebecca S. Reeves, DrPh, RD

Dr. Reeves is a past president of the American Dietetic Association, the nation's largest organization of food and nutrition professionals. An expert in the prevention and treatment of obesity and heart disease, Dr. Reeves is an assistant professor of medicine and managing director of the Behavioral Medicine Research Center at Baylor College of Medicine in Houston. Dr. Reeves is project director for nutrition intervention studies focused on heart disease and the behavioral treatment of obesity, including "Look AHEAD," an 11-year study of the role of sustained weight loss among overweight people with type 2 diabetes in reducing cardiovascular problems. Reeves' recent research has focused on weight-loss treatments for Mexican-American and African-American women, binge eating and alternative treatments for obesity.

Barry L. Zoumas, PhD

Dr. Zoumas is currently the Alan R. Warehime Professor of Agribusiness and Professor of Food Science and Nutrition at The Pennsylvania State University, USA. Dr. Zoumas has served on a number of corporate boards and currently is a Board Member of Tate & Lyle and a former member of the National Academy of Sciences Food and Nutrition Board. He is also President of the North American Branch of the International Life Sciences Institute. Prior to joining Penn State's faculty, Dr. Zoumas was Vice President of Science and Technology at Hershey Foods Corporation where he was responsible for all corporate technical activities including Research and Development, Quality Assurance, Corporate Engineering, Environmental and Regulatory Affairs and Agribusiness. He also spent 6 months as a visiting scientist at the Food and Agricultural Organization of the United Nations in Rome, Italy.

A Conversation with Dr. Rebecca S. Reeves and Dr. Barry L. Zoumas

An epidemiological study published in the July 2007 issue of Circulation: Journal of the American Heart Association reported findings suggesting that drinking soft drinks, whether regular or diet, is associated with increased risk for metabolic syndrome and heart disease.[1]

Because this and other epidemiological studies receive a good deal of media attention, consumers might ask health professionals about health risks associated with drinking soft drinks. To help you address these questions, the Beverage Institute for Health & Wellness (BIHW) of the Coca-Cola Company asked leading obesity and nutrition experts Rebecca S. Reeves, DrPH, RD and Barry L. Zoumas, PhD to review the study and share their insights.

BIHW: ***What should consumers take away from this study?***

Dr. Reeves: Until the randomized controlled trial is conducted that actually proves that consuming soft drinks causes metabolic syndrome, consumers should not be frightened about drinking soft drinks in moderation.

There are many factors which contribute to the makeup of a person's lifestyle, such as the types and minutes of physical activity, various eating patterns, combinations and selections of food, number of snacks per day, number of hours of sleep, type of employment, the biological makeup of your friends (overweight or obese), that can contribute to the development of metabolic syndrome or other disease. It is very difficult to capture all of these characteristics for a person in one or more questionnaires administered during a study. That means that the true reason for an effect such as metabolic syndrome surfacing as a result of an action such as drinking sodas may be not identified. It could be that in this study drinking regular and diet beverages are just a "proxy," or stand in, for the actual reason people developed this condition, which this study did not identify.

Dr. Zoumas: My concern with the types of media headlines this research generated is that consumers might conclude that simply avoiding drinking soft drinks will prevent or cure metabolic syndrome. This simplistic message can do more harm than good, since it doesn't encourage consumers to address the underlying problems related to metabolic syndrome, which are excess calories from all sources and physical inactivity. The message we should be delivering is the need to control calories from all sources and increase physical activity.

With respect to soda, it is clear that there are people who consume too much sugar-sweetened liquids, but these people are also very likely to be consuming too many calories from other foods, as well.

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BIHW: ***Does this study actually show that consuming soft drinks can cause metabolic syndrome, or that avoiding soft drinks can prevent it?***

Dr. Reeves: No, this study did not show cause and effect, it only attempted to show an association between the behavior of drinking soft drinks and the outcome of metabolic syndrome. Because the authors could not control all of the factors which contribute to the causation of metabolic syndrome in a person, the actual factors initiating this condition could have been omitted.

> "There is no logical explanation for the hypothesis that...diet soft drinks could cause metabolic syndrome…"

There is no logical explanation for the hypothesis that the behavior of drinking diet soft drinks could cause metabolic syndrome unless there is another behavior that accompanies it which is the culprit. For example, perhaps persons who drink diet soft drinks also eat high-calorie foods like potato chips and dip or fried foods whenever they are consuming these beverages. So it might not be the diet soda that is contributing to the metabolic condition but the excess calories consumed through the food that regularly accompanies the beverage.

Dr. Zoumas: I agree. Although this study raises interesting questions, because it is an observational (epidemiological) study, no causation can be drawn. Only clinical trials can show cause and effect. The results should not be interpreted as saying that drinking one or more regular or diet sodas per day will result in metabolic syndrome or that avoiding them will prevent it.

To me, the most logical explanation for the results relate to excess calorie consumption and sedentary behavior, and that soft drink consumption may be a 'marker' for other behaviors like too little physical inactivity and an overall diet that provides excess calories.

We know that to a large degree, the major chronic disease killers, including heart disease and cancer, are an extension of what people do—or not do—as they go about the business of daily living. Health-damaging behaviors, in particular, tobacco use, lack of physical activity and poor nutrition, are a big problem. So, I think consumers should understand how important it is to eat healthy, exercise, and monitor their weight.

BIHW: ***Should people who consume diet soft drinks stop doing so based on this study's results? Should people with diabetes avoid diet soft drinks?***

Dr. Zoumas: No. People who drink diet soft drinks should not quit doing so based on the findings of this study. This includes those with diabetes and those without.

Studies clearly show that people can successfully lose weight on weight loss diets that include diet soft drinks, and there is evidence that dieters who use diet drinks tend to regain less weight. But, the key to weight control isn't whether someone drinks diet soft drinks or not, but whether they are proactive and diligent about controlling daily calories and getting enough exercise. But if someone isn't mindful of their calories, simply drinking diet soft drinks won't prevent them from over-consuming calories from other foods.

For most of us, keeping calories in balance requires three things: regular monitoring of our body weight, getting regular exercise, and practicing behaviors that help us stay in control of calories throughout the day. This means being mindful of the calories in what we eat and drink, watching portion sizes, choosing lower-calorie versions of foods, limiting snacks and balancing the extra calories in one food or drink by trimming calories somewhere else.

Dr. Reeves: I agree—persons who drink diet soft drinks could continue to do so in moderation as well as persons with diabetes.

BIHW: ***What are the most important things that people can do to reduce their risk for developing metabolic syndrome and/or heart disease?***

Dr. Reeves: The most important lifestyle factors which a person should incorporate into his/her daily living are some type of regular physical activity, consumption of foods from all food groups with emphasis on fruits, vegetables, low-fat dairy products, and whole grains, portion control of food and maintenance of a healthy weight.

Dr. Zoumas: I agree. Effective lifestyle changes, including losing weight, increasing physical activity and following a heart-healthy diet, are the most important things people can do to reduce metabolic risk factors.

With that said, the question that emerges is: Is there room in a healthy diet for sugar-sweetened and diet beverages? Clearly, the answer is yes. For example, a 2,000 calorie diet based on the USDA's food

guide pyramid, which is considered a model for healthy eating plans, includes about 250 'discretionary' calories that can be spent on things like added sugar and fat. So yes, a regular soft drink, which contains about 140 calories in a 12-ounce can, can fit in a healthy diet.

As for diet beverages, they can make it easier for some people to control calories. For others, they are simply a low calorie alternative that can allow them to spend their discretionary calories on other foods. But, by themselves, they can't make you lose weight—or gain it. They remain a fine choice in moderation and are certainly safe.

> "The message we should be delivering is the need to control calories from all sources and increase physical activity."

What Other Experts Say:

The American Heart Association—excerpts from statement of 9.23.2007

"Since this is an observational study, it is important to note that the study does not show that soft drinks cause risk factors for heart disease. It does show that the people studied who drank soft drinks were more likely to develop risk factors for heart disease.

"However, it is possible that other factors could explain this relationship. Often people who drink soft drinks also eat and drink more calories, saturated fat and trans fat and less fiber and dairy products. Also, these people tend to be less physically active. This was true among the subjects in this study.

"While the authors did account for these aforementioned diet and lifestyle factors in the analysis, it is possible that other lifestyle factors still account for the measured increase in risk factors leading to heart disease. As the authors note in the study, more research is needed to understand these associations before any recommendations can be made to the public.

"Diet soda can be a good option to replace caloric beverages that do not contain important vitamins and minerals. The American Heart Association supports dietary patterns that include low-calorie beverages like water, diet soft drinks, and fat-free or low-fat milk as better choices than full calorie soft drinks."

— Full statement available at http://www.americanheart.org

Barry Popkin—excerpts from "Soft Drink Dilemma," by Terri Coles (Reuters News)

"You've got to realize that in this study the diet soda drinkers were not your normal Framingham person," Popkin said. "They were people who had more health conditions." Therefore, many of the people drinking diet soda were doing so because they already had health problems, and had been told to by their doctors, not because they wanted to.

Baseline characteristics for the study participants show that those who drank soda at least once a day weighed more and had a higher Body Mass Index (BMI), with more of them already having a BMI over 30, which is defined as obesity. They also had larger waist circumferences, which may provide a more accurate measure of the risk of weight-related health problems than BMI alone. More of the soda drinkers were diabetic, and those who drank two or more sodas a day were more likely to be smokers.

The study results accounted for fat and trans fat intake, dietary fiber consumption, smoking and physical activity and still found the association between diet and regular soda consumption and metabolic syndrome, but its authors acknowledged that other factors may have an effect. Popkin pointed out that when diabetics were excluded from the findings, there was only a 16 percent higher risk of health problems in the soda drinkers.

— Available at http://features.us.reuters.com, accessed 7.23.2007

Additional resources

The American Heart Association
—www.americanheart.org

NHLBI Health Professional Materials
—www.womenshealth.gov/hearttruth
—www.nhlbi.nih.gov/health/prof/heart/index.htm

Reference

1. Dhingra R, Sullivan L, Jacques PF, Wang TJ, Fox CS, Meigs JB, D'Agostino RB, Gaziano JM, Vasan RS. Soft drink consumption and risk of developing cardiometabolic risk factors and the metabolic syndrome in middle-aged adults in the community. Circulation. 2007 Jul 31;116(5):480-8.

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