Artificially Sweetened Sodas Save Calories but not Kidneys

A "significant, twofold increased odds" for a fast decline of kidney function is linked to drinking two or more servings of artificially sweetened soda each day, according to a study presented at ASN Renal Week. Interestingly, a reduction in kidney function was not detected in members of the study population who consumed sugar-sweetened sodas.

According to the industry journal *Beverage Digest*, Americans consumed an average of 760 eight-ounce servings of soda in 2008.

The findings came from an analysis of health data on over 3000 women participating in the Nurses' Health Study by Julie Lin, MD, FASN, and Gary Curhan, MD, FASN, of Brigham and Women's Hospital.

The association between intake of artificially sweetened beverages and kidney function persisted even after Lin and Curhan accounted for age, caloric intake, obesity, high blood pressure, diabetes, cigarette smoking, physical activity, and cardiovascular disease.

Other studies have questioned the health effects of soda consumption. In 2007, Boston University scientists found that the risk for developing metabolic syndrome is 44 percent higher in people who daily consume one or more cans of diet soda and sugar-sweetened beverage. These findings came from an analysis of the Framingham Heart Study data on over 6000 people who filled out food questionnaires and were followed for an average of four years to gauge the health impact of their soft drink consumption habits. The study, funded by the National Institutes of Health and the American Diabetes Association, was published in the American Heart Association's journal *Circulation*.

In addition, Lin and Curhan noted that an association between sugar-sweetened soda and urinary protein was shown in a previous analysis of the nationally representative NHANES III population. However, information on kidney function change was not available then.

"There are currently limited data on the role of diet in kidney disease," Lin said. "While more study is needed, our research suggests that higher intake of artificially sweetened soda is associated with greater rate of decline in kidney function."

Because the participants in the study were older Caucasian women, the findings may not be directly applicable to men or people of other ethnicities, noted the scientists. They presented the paper, titled "Associations of Sweetened Beverages with Kidney Function Decline," during a free communication session.

Stem Cells Could Prevent AKI after Cardiac Surgery in High-Risk Patients

Allogeneic mesenchymal stem cells (MSC) could provide an effective new approach to reducing the rate of postoperative acute kidney injury (AKI) in high-risk patients, preliminary research suggests.

Led by Christof Westenfelder, MD, of the University of Utah, Salt Lake City, the researchers performed a phase I clinical trial with allogeneic MSC for the prevention of AKI in 15 patients undergoing coronary artery bypass grafting, with or without valve surgery. All patients had risk factors for AKI: kidney disease or other chronic disease, age older than 65, or bypass time longer than two hours.

All patients received allogeneic MSC according to the dose-escalation design. This form of stem cell therapy has been shown to preserve kidney function three months after ischemia-reperfusion AKI in rats via paracrine actions. In the new trial, there were no apparent adverse effects of MSC administration.

The treatment reduced patients' postoperative length of stay and hospital readmission rate by about half, compared to closely matched historical controls. At discharge, all patients treated with MSC had normal kidney function—in contrast, about 20 percent of control patients had AKI. Renal function remained normal through six months' of follow-up in MSC-treated patients. Kidney function declined progressively in the historical controls.

Allogeneic MSC shows promising safety and efficacy in preventing AKI and subsequent declines in renal function among cardiac surgical patients at high risk, the researchers said.

"Acute kidney injury is a common complication with high morbidity and mortality rates for which no specific therapy is currently available," Westenfelder said. "It is also increasingly recognized as the cause of progressive chronic kidney disease, eventually requiring dialysis therapy or a kidney transplant. New therapies for both the prevention and treatment of AKI are urgently needed."

Based on their phase I results, Westenfelder's group is planning a phase II multicenter study of MSC for AKI prevention.

"This would be an innovative approach for the prevention of AKI and has tremendous potential," said Anupam Agarwal, MD, of the University of Alabama at Birmingham.

The study, "Administration of Allogeneic Mesenchymal Stem Cells in Open Heart Surgery Patients is Safe and Prevents Post-operative AKI and CKD, and Reduces Length of Stay and Readmission Rates: Results of Phase I Trial," was part of a Renal Week session on Pathophysiology of Kidney Disease: Acute Kidney Injury.

Sodium and Carotene Affect eGFR

Lower dietary sodium and higher carotene intake may reduce a woman's estimated glomerular filtration rate (eGFR), according to work by Julie Lin, MD, FASN, and Gary Curhan, MD, FASN, of Brigham and Women's Hospital.

In their poster presentation, "Associations of Diet with Kidney Function Decline," the scientists did not report significant associations for other nutrients.

The study examined the influence of individual dietary nutrients on eGFR decline in over 3000 women with well-preserved kidney function at baseline between 1989 and 2000. The study participants were women in the Nurses' Health Study, including 730 nurses with diabetes.

"In women with well-preserved kidney function, higher dietary sodium intake was associated with greater kidney function decline, which is consistent with experimental animal data that high sodium intake promotes progressive kidney decline," Lin and Curhan reported.

In addition to sodium and carotene, nutrients targeted by the scientists included dietary protein (total, animal, vegetable, low-fat dairy, high-fat dairy, total dairy, and nondairy); dietary fat (total, saturated, trans, mono-saturated, polyunsaturated, animal and vegetable); cholesterol; dietary fiber (total, soluble, and insoluble); anti-oxidant vitamins (vitamins A, C, and E); vitamin D; folate; fructose; and potassium.

Cumulative average energy-adjusted nutrient intake was derived from the participants' 1984, 1986, and 1990 answers on the Food Frequency Questionnaires, the most common dietary assessment tool used in large epidemiologic studies of diet and health.

Primary outcome was > 30 percent decline in eGFR as estimated by the four-variable MDRD equation.

In the study population, the median age was 67 years, 97 percent were Caucasian, 54 percent had hypertension, 24 percent were diabetic, and median eGFR was 85 mL/min/1.73 m^2 in 1989. A total of 380 women (11.5 percent of the study population) experienced an eGFR decline of more than 30 percent.

New Renal Week symposium honors Steven C. Hebert, who broke open black box of tubule cells

Steven C. Hebert, MD, the board-certified nephrologist and physician-scientist responsible for "breaking open the black box of tubule cells," was honored at an ASN symposium featuring four former colleagues, who described recent studies that build upon Hebert's pioneering research on the thick ascending limb's function and dysfunction in kidney disease.

Serving as moderators of the inaugural Steven C. Hebert Memorial Symposium were Gerhard H. Giebisch, MD, professor emeritus of cellular and molecular physiology at Yale and Robert S. Hoover, MD, assistant professor of medicine at the University of Chicago. Support for the session was provided by an educational grant from Amgen.

Speakers reported recent insights into the role of different NCKK2 isoforms, the regulation of the membrane transport protein NKCC2's function by the WNK protein kinases and reactive oxygen species, and the role of the potassium channel ROMK in solute reabsorption. WNKs (with-no-lysine [K]) play a role in blood pressure control, and ROMK (renal outer medullary potassium) transports potassium out of cells.

The speakers were:

- Jürgen B. Schnermann, MD, chief of the Kidney Disease Branch at the National Institute of Diabetes and Digestive and Kidney Diseases.
- Gerardo Gamba, MD, PhD, professor of medicine at the Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán and Instituto de Investigaciones Biomédicas, National University of Mexico.
- Pablo A. Ortiz, PhD, associate professor at Henry Ford Hospital's division of hypertension and vascular research in Detroit.
- Tong Wang, MD, professor and director of Integrated Kidney Function Core at Yale.