Soft drink consumption and obesity: it is all about fructose

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FROM ABSTRACT:

Purpose of review: The purpose of the review is to suggest that fructose, a component of both sucrose (common sugar) and high fructose corn syrup, should be of concern to both healthcare providers and the public.

Recent findings: Consumption of sugar-sweetened beverages has increased steadily over the past century and with this increase has come more and more reports associating their use with the risk of overweight, diabetes and cardiometabolic disease.

In a meta-analysis of the relationship between soft drink consumption and cardiometabolic risk, there was a 24% overall increased risk comparing the top and bottom quantiles of consumption.

Several factors might account for this increased risk, including increased carbohydrate load and increased amounts of dietary fructose.

Fructose acutely increases thermogenesis, triglycerides and lipogenesis as well as blood pressure, but has a smaller effect on leptin and insulin release than comparable amounts of glucose.

In controlled feeding studies, fructose increases body weight, fat storage and triglycerides, as well as an increase in inflammatory markers.

Summary: The present review concludes on the basis of the data assembled here that in the amounts currently consumed, fructose is hazardous to the cardiometabolic health of many children, adolescents and adults.

THIS AUTHOR ALSO NOTES:

"Sucrose intake has risen steadily for more than 200 years. With this increase in sucrose has come an increased intake of fructose, as fructose is half the sucrose molecule."

"Consumption of sugar-sweetened beverages is still rising around the world and in the USA, it has increased from 11.8% of calories in 1965 to over 20% of calories by 2002."

Fructose sweeteners are linked to weight gain, diabetes, cardiometabolic disease, gout, and to cholesterol problems. “Studies comparing glucose and fructose have suggested that fructose is much more likely to be the culprit for these diseases than glucose.”

This author labels fructose that is naturally occurring in fruits and vegetables as “good fructose” and the fructose that comes from sucrose or HFCS as “bad fructose.”

Studies show that the consumption of fructose increases inflammatory markers, “and this component of soft drinks may be another reason for its association with cardiometabolic disease.”

Studies show that people's risk of being overweight or obese was positively associated with their soft drink consumption.

Studies conclude that a high intake of calorically sweetened beverages is a determinant for obesity.

“There are six studies that have shown relationships between soft drink consumption and the risk of developing diabetes.”

Animals fed a diet of trans-fat with HFCS to drink gained the most weight and had the most inflammatory changes. [Soda and fries]

The increased calorie consumption from calorie-sweetened beverages does not cause a reduction in caloric intake of solid foods.

Fructose is metabolized primarily in the liver where it can readily become a substrate for the backbone of the triglyceride molecule.

The metabolism of fructose in the liver enhances production of uric acid, which contributes to cardiovascular disease.

Fructose administration increases blood pressure while glucose does not.

“Soft drinks are clearly a part of our culture and their consumption has risen steadily for more than 50 years. A 20-ounce soft drink made with HFCS has about 250 kcal. Thus, an extra 20-ounce soft drink each day is probably enough to account for the increased body weight over the last quarter of a century.”

“The rising consumption of calorie-sweetened beverages provides a rising intake of fructose with all of its potential negative biological effects.”

“Based on this review of the literature, this reviewer concludes that in the amounts currently consumed, fructose is hazardous to the cardiometabolic health of many children, adolescents and adults.”

"An increase in the risk of diabetes mellitus, metabolic syndrome, coronary heart disease and gout has been reported with higher consumption of soft drinks."

"Replacing fructose-containing beverages with healthier alternatives such as water would be an important strategy in the battle of the bulge and its cardiometabolic consequences."

CONCLUSION

"Fructose, a component of both sucrose (common sugar) and HFCS, in the amounts now consumed should be of concern to both healthcare providers and the public."

"The growing evidence of its [fructose] association with the risk of overweight, diabetes and cardiometabolic disease is highlighted in the meta-analyses of the relationship between soft drink consumption and cardiometabolic risk."

KEY POINTS FROM DAN MURPHY

1) "Sucrose intake has risen steadily for more than 200 years. With this increase in sucrose has come an increased intake of fructose, as fructose is half the sucrose molecule."

2) "Consumption of sugar-sweetened beverages is still rising around the world and in the USA, it has increased from 11.8% of calories in 1965 to over 20% of calories by 2002."

3) "Consumption of sugar-sweetened beverages has increased steadily over the past century and with this increase has come more and more reports associating their use with the risk of overweight, diabetes and cardiometabolic disease."

4) The increase of cardiometabolic risk is 24% greater in those who consumed the highest quantile of sugary soft drinks.

5) Fructose increases triglycerides, elevates blood pressure, increases inflammatory markers and reduces leptin release. [Leptin is the hormone that tells the brain that one is full and no longer hungry, so one stops eating]

6) "In the amounts currently consumed, fructose is hazardous to the cardiometabolic health of many children, adolescents and adults."

7) Fructose sweeteners are linked to weight gain, diabetes, cardiometabolic disease, gout, and to cholesterol problems. "Studies comparing glucose and fructose have suggested that fructose is much more likely to be the culprit for these diseases than glucose."

8) This author labels fructose that is naturally occurring in fruits and vegetables as "good fructose" and the fructose that comes from sucrose or HFCS as "bad fructose."

9) The consumption of fructose increases inflammatory markers, "and this component of soft drinks may be another reason for its association with cardiometabolic disease."

10) People's risk of being overweight or obese is positively associated with their soft drink consumption. A high intake of calorically sweetened beverages is a determinant for obesity.

11) "There are six studies that have shown relationships between soft drink consumption and the risk of developing diabetes."

12) Animals fed a diet of trans-fat with HFCS to drink gained the most weight and had the most inflammatory changes. [Fries and a soft drink]

13) The increased calorie consumption from calorie-sweetened beverages does not cause a reduction in caloric intake of solid foods.

14) Fructose is metabolized primarily in the liver where it can readily become a substrate for the backbone of the triglyceride molecule.

15) The metabolism of fructose in the liver enhances production of uric acid, which contributes to cardiovascular disease.

16) Fructose administration increases blood pressure while glucose does not.

17) A 20-ounce soft drink made with HFCS each day is "probably enough to account for the increased body weight over the last quarter of a century."

18) "The rising consumption of calorie-sweetened beverages provides a rising intake of fructose with all of its potential negative biological effects."

19) "An increase in the risk of diabetes mellitus, metabolic syndrome, coronary heart disease and gout has been reported with higher consumption of soft drinks."

20) "Replacing fructose-containing beverages with healthier alternatives such as water would be an important strategy in the battle of the bulge and its cardiometabolic consequences."

21) "The growing evidence of its [fructose] association with the risk of overweight, diabetes and cardiometabolic disease is highlighted in the meta-analyses of the relationship between soft drink consumption and cardiometabolic risk."