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How does limiting sugar early in life affect adult health?

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Abstract

What do soda, ice cream, and candy have in common? They all contain lots of added sugar! While sugar makes foods taste great, too much added sugar can negatively impact a person's health. For instance, studies link high added sugar levels to type 2 diabetes and hypertension. These diseases often occur later in life.

Because of World War II, the United Kingdom rationed several foods, including sugar, from 1940 to 1953. In September 1953, sugar rationing ended. This event likely caused diets to be lower in sugar before and higher after that date. We looked at the data and noticed that there was indeed an increase in the amount of sugar people ate right after the sugar rationing ended.

We wanted to understand how being in a place with either very little or a lot of sugar early in life affected a person's health as an adult. So, we studied adults born in the UK around the end of sugar rationing who were later diagnosed with type 2 diabetes and hypertension. For this group, we found that restricting sugar until age two decreased the chances of developing type 2 diabetes and hypertension. It also delayed when these diseases started.

Introduction

Many of the foods we enjoy have **added sugars**. Added sugars are sugars that aren't present naturally, but added to food later when it is prepared. For example, fruit like a banana has sugar naturally present, but fruit yogurt or breakfast cereals often have sugar added to them. From **conception** until the age of two, dietary guidelines recommend zero added sugars. But many foods or drinks that pregnant mothers, babies, and toddlers consume are high in added sugars. For example, by the time children in the USA are two years old, they eat an average of 6–7 teaspoons (25–29 grams) of added sugar a day.

Animal studies show a link between high sugar levels early in life and **type 2 diabetes** in adulthood. Type 2 diabetes is a disease that makes it difficult for the body to regulate blood sugar levels. When blood sugar is high for a long time, it can cause circulatory, nervous, and immune system

Nutrition Facts

8 servings per container
Serving size **8 fl oz (240mL)**

Amount per serving
Calories **110**

	% Daily Value*
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 5mg	0%
Total Carbohydrate 27g	10%
Dietary Fiber 0g	0%
Total Sugars 25g	
Includes 23g Added Sugars	46%
Protein 0g	
Vitamin D 0mcg	0%
Calcium 0mg	0%
Iron 0mg	0%
Potassium 40mg	0%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Many foods contain added sugar, which is linked to type 2 diabetes and hypertension in adulthood. You can look at the nutrition facts on food packages to see the total amount of sugar, which includes the sugar found naturally in the food, and the amount of added sugar.

issues. Excess sugar is also linked to **hypertension**. Hypertension occurs when someone's blood pressure is too high. Long-term hypertension can lead to heart attack or a **stroke**.

We wanted to use human data to support the link between sugar and these two diseases. So we conducted an event study. The event was the end of sugar **rationing** in the United Kingdom after World War II. Between 1940 and 1953, people could only have small amounts of sugar because it was in low supply. We hypothesized that people conceived or born before the end of sugar rationing were less likely to have type 2 diabetes and hypertension as adults. And if these diseases did develop, we expected them to start later.

Methods

We used a survey with 60,183 people born between October 1951 and March 1956 in the UK. We classified people born before July 1954 as rationed. We classified people born after July 1954 as never rationed. We used a subset of the never rationed group as a control. Then, we divided the rationed category into smaller groups. We based these groups on how long the person experienced rationing. Then we analyzed the data to see who had type 2 diabetes and hypertension. We also examined how old the person was when diagnosed with these conditions.

We then calculated a ratio. This number compared the likelihood of getting the disease between the rationed group and the never rationed control group.

- When the ratio was greater than 1, the rationed group was more likely to get the disease.
- When the ratio was less than 1, the rationed group was less likely to get the disease.
- When the ratio was 1, the groups had an equal chance of getting the disease.

Results

We saw that as the length of sugar rationing increased, the less likely people were to get diagnosed with type 2 diabetes and hypertension later in life (Fig. 1). For a person who experienced sugar rationing from pregnancy to age two, the ratio was 0.62 for type 2 diabetes. It was 0.79 for hypertension.

How did the likelihood of developing type 2 diabetes compare for people who lived under sugar rationing only before they were born and people who lived under sugar rationing until the age of 2?

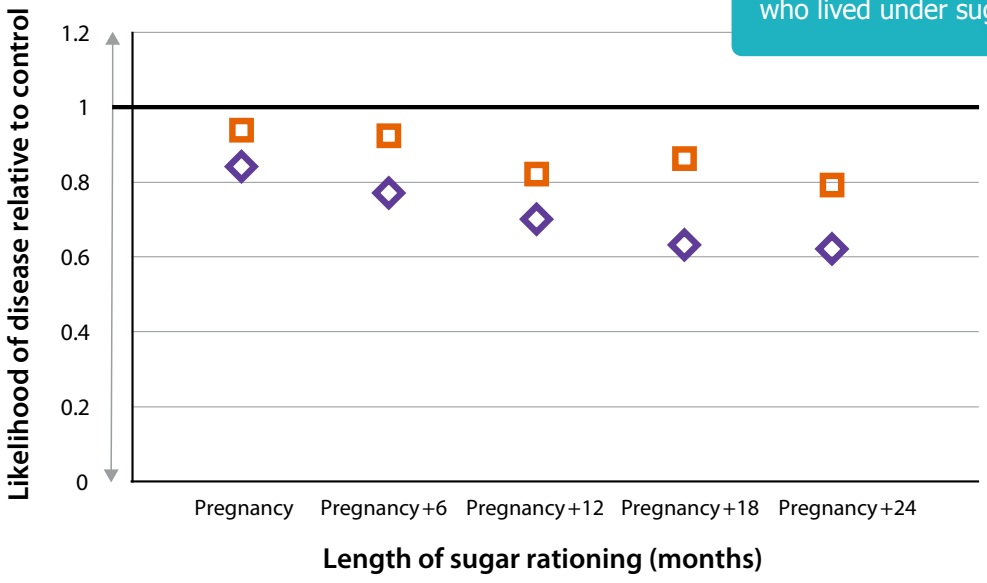

Figure 1: The likelihood (relative to a control) of developing hypertension or type 2 diabetes as the length of exposure to sugar rationing increases.

There was also a delay in the start of these diseases. Type 2 diabetes started 4 years later for people who experienced sugar rationing until age two compared to those never rationed. There was a 2-year delay for people diagnosed with hypertension.

Discussion

Our study showed that having less sugar early in life may benefit a person's health as an adult. Adults who had sugar rationing exposure before age 2 had a lower risk of type 2 diabetes and hypertension. That means people who probably ate less sugar early in life were less likely to develop these diseases later in life. And when people did develop these diseases, they started later.

Our analysis adds to the growing evidence that limiting added sugars during pregnancy and early childhood is important for health. Eating sugar early in life can cause a preference for sweet foods. When people prefer sweet foods as children, they are more likely to have high sugar diets into adulthood. That means that they tend to eat more sugar than recommended throughout their life.

We recommend more research to determine the exact pathways to these effects as well as what amount of added sugar is the best at each stage of life.

Conclusion

What you eat when you are young may affect your health when you are an adult. That means it is important at every stage of life to balance your diet. You need to be careful when selecting your foods. Always make sure to check the nutrition labels on foods. These labels tell you the amount of added sugars and other nutrients per serving. This information can help you limit the number of foods high in added sugars that you eat. You can also replace such foods with fruits, vegetables, and proteins. Eating these healthier alternatives provides your body with the nutrients it needs to grow and be healthy.

Glossary of Key Terms

Added sugars - sugar or sweeteners that are not present naturally in a food, but added during its preparation. Many foods like fruit or milk contain natural sugars. Added sugars can include various kinds of sugar, honey, molasses, maple syrup, corn syrup, and so on.

Conception - the moment when pregnancy begins, which occurs when the sperm fertilizes the egg.

Hypertension - a condition when a person's blood pressure is elevated/much higher than normal for a long time.

Rationing - allowing someone to only have a fixed amount of something, often because there isn't enough of it.

Stroke - when blood can't get to a part of the brain, which can cause brain cells to die. This can happen if a blood vessel in or on the brain breaks, causing blood to flow into brain tissue (hemorrhagic stroke), or if a blood clot blocks a blood vessel in the brain, stopping blood flow (ischemic stroke).

Type 2 diabetes - a condition caused by a problem with the way that the body regulates and uses sugar. When a person has type 2 diabetes, they can't keep the amount of sugar in their blood at a safe level.

Check your understanding

1. What diseases are linked to a diet high in added sugars, and why are they a concern?

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2. Why did we look at data from people born in the 1950s?

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3. Dietary guidelines state that the maximum amount of added sugars a child above age 2 should eat per day is 25 grams (about 6 teaspoons). Evaluate your typical day of meals, snacks, and drinks in terms of added sugar. Reading nutrition labels could help. Do you think that you are above or below the recommended amount of added sugar? Explain your answer.

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4. With a partner, identify three different foods that have a large amount of added sugar. For each food item, recommend an alternative food that a person could eat. Then explain your recommendation.

REFERENCES

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