Medical Xpress

Sugar doesn't make kids hyperactive, suggests neuroscientist

May 28 2024, by Amy Reichelt

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It's a Saturday afternoon at a kids' birthday party. Hordes of children are swarming between the spread of birthday treats and party games. Half-eaten cupcakes, biscuits and lollies litter the floor, and the kids seem to

have gained superhuman speed and bounce-off-the-wall energy. But is sugar to blame?

The belief that eating sugary foods and drinks leads to hyperactivity has steadfastly persisted for decades. And parents have curtailed their children's intake accordingly.

Balanced nutrition is critical during childhood. As a neuroscientist who has studied the negative effects of high sugar "junk food" diets on brain function, I can confidently say excessive sugar consumption does not have benefits to the young mind. In fact, neuroimaging studies show the brains of children who eat more processed snack foods are smaller in volume, particularly in the frontal cortices, than those of children who eat a more healthful diet.

But today's scientific evidence does not support the claim that sugar makes kids hyperactive.

The hyperactivity myth

Sugar is a rapid source of fuel for the body. The myth of sugar-induced hyperactivity can be traced to a handful of studies conducted in the 1970s and early 1980s. These were focused on the Feingold Diet as a treatment for what we now call Attention Deficit Hyperactivity Disorder (ADHD), a neurodivergent profile where problems with inattention and/or hyperactivity and impulsivity can negatively affect school, work or relationships.

Devised by American pediatric allergist Benjamin Feingold, the diet is extremely restrictive. Artificial colors, sweeteners (including sugar) and flavorings, salicylates including aspirin, and three preservatives (butylated hydroxyanisole, butylated hydroxytoluene, and tert-Butrylhdryquinone) are eliminated.

Salicylates occur naturally in many healthy foods, including apples, berries, tomatoes, broccoli, cucumbers, capsicums, nuts, seeds, spices and some grains. So, as well as eliminating processed foods containing artificial colors, flavors, preservatives and sweeteners, the Feingold diet eliminates many nutritious foods helpful for healthy development.

However, Feingold believed avoiding these ingredients improved focus and behavior. He conducted some small studies, which he claimed showed a large proportion of hyperactive children responded favorably to his diet.

Flawed by design

The methods used in the studies were flawed, particularly with respect to adequate control groups (who did not restrict foods) and failed to establish a causal link between sugar consumption and hyperactive behavior.

Subsequent studies suggested less than 2% responded to restrictions rather than Feingold's claimed 75%. But the idea still took hold in the public consciousness and was perpetuated by anecdotal experiences.

Fast forward to the present day. The scientific landscape looks vastly different. Rigorous research conducted by experts has consistently failed to find a connection between sugar and hyperactivity. Numerous placebo-controlled studies have demonstrated sugar does not significantly impact children's behavior or attention span.

One landmark meta-analysis study, published almost 20 years ago, compared the effects of sugar versus a placebo on children's behavior across multiple studies. The results were clear: in the vast majority of studies, sugar consumption did not lead to increased hyperactivity or disruptive behavior.

Subsequent research has reinforced these findings, providing further evidence sugar does not cause hyperactivity in children, even in those diagnosed with ADHD.

While Feingold's original claims were overstated, a small proportion of children do experience allergies to artificial food flavorings and dyes.

Pre-school aged children may be more sensitive to food additives than older children. This is potentially due to their smaller body size, or their still-developing brain and body.

Hooked on dopamine?

Although the link between sugar and hyperactivity is murky at best, there is a proven link between the neurotransmitter dopamine and increased activity.

The brain releases dopamine when a reward is encountered—such as an unexpected sweet treat. A surge of dopamine also invigorates movement—we see this increased activity after taking psychostimulant drugs like amphetamine. The excited behavior of children towards sugary foods may be attributed to a burst of dopamine released in expectation of a reward, although the level of dopamine release is much less than that of a psychostimulant drug.

Dopamine function is also critically linked to ADHD, which is thought to be due to diminished dopamine receptor function in the brain. Some ADHD treatments such as methylphenidate (labeled Ritalin or Concerta) and lisdexamfetamine (sold as Vyvanse) are also psychostimulants. But in the ADHD brain the increased dopamine from these drugs recalibrates brain function to aid focus and behavioral control.

Why does the myth persist?

The complex interplay between diet, behavior and societal beliefs endures. Expecting sugar to change your child's behavior can influence how you interpret what you see. In a study where parents were told their child had either received a sugary drink, or a placebo drink (with a non-sugar sweetener), those parents who expected their child to be hyperactive after having sugar perceived this effect, even when they'd only had the sugar-free placebo.

The allure of a simple explanation—blaming sugar for hyperactivity—can also be appealing in a world filled with many choices and conflicting voices.

Healthy foods, healthy brains

Sugar itself may not make your child hyperactive, but it can affect your child's mental and physical health. Rather than demonizing sugar, we should encourage moderation and balanced nutrition, teaching children healthy eating habits and fostering a positive relationship with food.

In both children and adults, the World Health Organization (WHO) recommends limiting free sugar consumption to less than 10% of energy intake, and a reduction to 5% for further health benefits. Free sugars include sugars added to foods during manufacturing, and naturally present sugars in honey, syrups, fruit juices and fruit juice concentrates.

Treating sugary foods as rewards can result in them becoming highly valued by children. Non-sugar rewards also have this effect, so it's a good idea to use stickers, toys or a fun activity as incentives for positive behavior instead.

While sugar may provide a temporary energy boost, it does not turn children into hyperactive whirlwinds.

Provided by The Conversation

Citation: Sugar doesn't make kids hyperactive, suggests neuroscientist (2024, May 28) retrieved 28 June 2024 from
https://medicalxpress.com/news/2024-05-sugar-doesnt-kids-hyperactive-neuroscientist.html