

ARE SOFT DRINKS A SCAPEGOAT FOR CHILDHOOD OBESITY?

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In an editorial accompanying the study by Mrdjenovic and Levitsky¹ on the topic of sweetened drinks and childhood nutrition, Schwartz² proposed that Americans “reduce the availability and limit portion sizes of sugar-sweetened drinks sold at school and provided at home.” In the study, 30 children 7 to 13 years of age acted as their own controls, collecting daily diet records and weighing food to estimate intake from a baseline period through 4 to 8 weeks of follow-up. Body mass index was measured regularly. The data showed that not only were those children with the highest intake of sweetened drinks consuming greater daily energy, but also that sweet drinks displaced milk from their diet. The resulting trade-off resulted in lower daily protein, calcium, phosphorus, magnesium, and vitamin A. The authors concluded that excessive sweetened-drink consumption associated with decreased milk intake may be one important risk factor for childhood obesity and nutrient deficiencies.¹ In his editorial, Schwartz² recommended teaching children to drink water for thirst, promoting healthier choices in vending machines in schools and communities, prohibiting advertising of sweetened beverages in schools and daycare centers, and even levying small taxes on soft drinks and snack foods to be used to educate children and fund extra-curricular activities. In light of the accumulating evidence, Schwartz’s recommendations to limit sweetened drinks would seem reasonable. But have we gone too far in making soft drinks the fall guy for obesity?

Some think so. Subsequent letters to the editor, as well as press releases from representatives of the soft drink industry, disagreed with the conclusions of the authors of the study.³⁻⁵ They objected to recommendations from the healthcare community that supported curbing soft drink consumption. The respondents felt that the designation of sweetened drinks as a cause for such a complex, multi-factorial problem as obesity was simplistic. They cited declining physical activity and increasing television and screen time as etiologies with a greater base of research evidence than that for soft drinks. Likewise, frequency of fast food, extreme portion sizes, and other unbalanced patterns of food consumption have had an equal or greater impact than that of soft drinks. They stated that the data on the increase in soft drink consumption are contradictory. Despite several studies based on the USDA’s National Health and Nutrition Examination Survey and the Continuing Food Survey of Food Intakes by Individuals methodologies that showed an increasing trend,⁶⁻¹² not all studies demonstrated this trend.¹³ In their public and private communications, representatives of the soft drink industry cited a study by Park et al¹³ that suggests that carbonated soft drink consumption has not increased, nor has milk consumption fallen, over the past decade, whereas obesity has accelerated. In addition, they state that research has failed to confirm the displacement of milk intake with rising soft drink consumption. Ultimately, they cite evidence that consumption of carbonated soft drinks from vending machines at school is minimal, only 2.5 oz per week, certainly insufficient to account for the obesity crisis.³

Many of their objections are valid. Certainly, soft drinks are not the root cause of obesity. The healthcare community has convinced Americans that there is an obesity epidemic. Now the public wants health professionals to identify the villain. Finding a single culprit would be convenient, but it will not happen with obesity. This disease is wrapped in genetics and culture, behavior and psychology. It is important to recognize that even if soft drink consumption was eliminated through a zealous, latter-day prohibition movement, it is unlikely to eliminate obesity, given the many factors that contribute.¹⁴ However, among those many factors, soft drinks have a prominent place. Although obesity prevention will require many interventions that affect all aspects of children’s lives, curbing the current intake of sugar consumed in the form of sweetened drinks will be one of the most

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important strategies. The objections of the soft drink industry sidestep the intent of the recommendations being made by pediatricians. And in doing so, the industry may miss an opportunity to play a central role in helping to unravel childhood obesity.

IN A CROWDED FIELD, WHY ARE SOFT DRINKS SINGLED OUT?

Far from picking on soft drinks as the sole cause for obesity, the American Academy of Pediatrics (AAP) has issued several policy statements on a broad array of issues surrounding childhood obesity. The AAP Committee on Nutrition statement on “The Prevention of Pediatric Overweight and Obesity” was issued in August 2003, addressing genetics, family dynamics and the home environment, recent societal changes, the decline in physical activity and concomitant rise in television viewing, as well as dietary factors that promote obesity.¹⁴ Previously, the AAP Committee on Nutrition recommended a limitation on juice intake by babies to lessen the risk of overweight.¹⁵ In a clinical report on the prevention and treatment of diabetes type II, the AAP cited the role of the community in helping to prevent the advent of obesity-related diabetes through improved physical activity and nutrition, especially among high-risk populations.¹⁶ The Committee on Sports Medicine called for healthy weight-management practices for children participating in athletics.¹⁷ The Committee on School Health and the Committee on Sports Medicine jointly called on schools to increase opportunities for daily physical activity and recommended several ways to achieve it.¹⁸ The Committee on Public Education urged avoidance of television and media viewing for children under the age of 2 years and urged limiting viewing to 1 to 2 hours for all children above the age of 2 years.¹⁹ It was only in January 2004 that the Committee on School Health (COSH) issued the statement “Soft Drinks in Schools,” adding it to the list of statements on obesity.²⁰

Why were soft drinks singled out in the AAP COSH statement? American children over-consume foods that constitute the tip of the USDA Food Guide Pyramid, the section labeled “discretionary fats and sugars,” a term that connotes fats and sugars added to the diet by choice, not inherent in the foods themselves.^{9,12,21-23} Currently, American children and adults consume nearly one third of their daily energy from this class of foods; ie, energy-dense, nutrient-poor foods, also termed snack foods.^{24,25} For the US population as a whole, added sweeteners account for 16% of total daily energy.⁹ Soft drinks are the number one source of added sugars in the American diet and account for 33%. When the number two source, fruit drinks, is added, together they account for 43% of the total added sugars.¹² For children, especially teens, the impact of soft drinks is even greater. As a food group, added sugars constitute 18% to 20% of a child’s daily energy.⁹ Sweetened soft drinks amount to 40% of all added sugars in a child’s diet and with the addition of fruit drinks, more than 50%.⁹ Americans have been warned to moderate their sugar intake.²² A limit of 6% to 10% of daily

calories from the combined added sugars in the diet has been recommended.^{12,26} With many common food products, such as ketchup and spaghetti sauce, containing added sugars, dietary recommendations are easily exceeded. For a child consuming 1300 kcal per day, this represents only 6 teaspoons of added sugars, and for a teenager consuming 2800 kcal per day, 18 teaspoons of sugars, excluding sugars inherent in fruits and dairy products. Such a modest amount can be consumed at a single sitting in the form of a large soft drink at a fast food restaurant. Daily adolescent intake of sweetened soft drinks averages nearly two 12-oz servings per day, or the equivalent of 20 teaspoons of sugar and 300 kcal.^{10,27} This would be less of a problem if soft drink intakes were offset by decreases in energy intake elsewhere in the diet. However, studies suggest that such calories are added to the daily total.^{28,29}

IS THE PROPOSED CONNECTION BETWEEN OVER-CONSUMPTION OF SOFT DRINKS AND OBESITY SUPPORTED BY RESEARCH?

Besides the study by Mrdjenovic and Levitsky already cited,¹ two other longitudinal, randomized studies have been done using late elementary school and middle-school children. Both showed an effect of soft drink consumption on weight.^{30,31} In the first study, Ludwig et al³⁰ followed 548 children 11 to 12 years of age prospectively for 19 months. Soft drink consumption increased 57% as obesity rose 9.3%. When diet, activity, television, and anthropometrics were controlled for, each soft drink consumed daily was shown to increase the child’s risk of obesity by 60%. In the second study, James et al³¹ sought to determine whether reducing consumption of carbonated beverages had an impact on weight gain. The authors followed 644 children 7 to 11 years of age for 1 school year. Using a focused intervention program meant to promote alternate drinks, the control group increased 0.2 glasses (50 mL), whereas the treatment group decreased carbonated soft drink intake by 0.6 glasses per day (150 mL). At 12 months, the percent overweight and obese children among controls increased by 7.5% but decreased by 0.2% in the intervention group. Eliminating just a few ounces of sweetened drinks is likely to affect the risk of childhood obesity substantially. Investigators suggest that small alterations in daily energy consumption may have significant implications. Even small amounts of sweetened drinks consumed at home, at school, and in the community may have a cumulative effect. Hill and colleagues³² calculated that altering the energy gap by only 0.42 MJ/day (100 kcal/day)—which, ironically, is the equivalent of one 8-oz serving of sweetened soft drink—would prevent excessive weight gain in most Americans. In a review of sugar consumption in the American diet, Krebs-Smith¹² concluded that even though added sugars are not the sole cause of obesity and that both energy intake and expenditure also are suspects, the fact that large segments of the population are experiencing an energy surplus makes it difficult to justify regular intake of soft drinks because of the additional, nutritionally empty calories.

Soft drink industry representatives cite the National Family Opinion World Group Share of Intake Panel (SIP) study, which they funded, as evidence for their claim that soft drinks are not over-consumed and are rarely consumed in schools, certainly not in amounts that would contribute to obesity.^{3-5,13} When children 1 to 5 years of age in the study were examined as a group, only 3.7 oz of carbonated soft drinks were consumed per child per day, a fall from 5.2 oz in the 1987-88 survey, according to their data. However, even the Park survey data showed that teen females consumed 16 oz per day and teen males 23 oz per day, amounts similar to those reported in other surveys.^{8,10} The SIP survey is a mail marketing survey that utilized 2-week family diaries from 12,000 persons per year to monitor total beverage intakes. The data were weighted quarterly to be representative of the US population, but it was not a randomized sampling. The study group was further biased by self-selection. Instructions were given in writing and not reviewed with participants by trained research assistants using multiple pass methodologies through onsite or phone contact, as was the case for larger, randomized national surveys. Park¹³ cited a single decade of data, eliminating the acceleration of soft drink consumption that occurred in the 1970s and 1980s. Park's frequently cited statistics on consumption of carbonated soft drinks neglects other, faster growing segments of the sweetened drink market.¹³ Park's data on fruit drinks, eg, showed an increase across all age groups and both genders.¹³ Irrespective of the validity of the SIP study, the question for the AAP COSH was whether soft drink contracts in schools promoted further soft drink consumption by students. No study to date has examined the effects on student consumption patterns of introducing a soft drink contract into a school district. But current levels of consumption suggest that students do not need further encouragement.

ARE THERE NUTRITIONAL CONSEQUENCES FROM OVER-CONSUMPTION OF SOFT DRINKS?

Besides excess sugar consumption as a source of unnecessary daily energy, the AAP COSH also considered the corresponding decline in milk consumption as soft drink intake increased and its effect on the daily nutrient profile of children. Milk is a nutrient-dense food. Its elimination from a child's diet is not without consequences. Risk of future osteoporosis and bone fractures because of inadequate daily calcium is only the most prominent clinical issue associated with declining milk consumption. Based on National Health and Nutrition Examination Survey data from 1999-2000, several nutrients have become "problem nutrients" because of consumption rates falling below the daily recommended intakes.³³ Corresponding to this phenomenon, milk intake also has fallen as the intake of sweetened drinks has risen. Several studies have shown that the two are closely connected.^{1,22,34-36} This reciprocal relationship suggests that displacement of milk by sweetened drinks is one of the principle factors that fuels some nutritional deficiencies noted

in children.^{6,37,38} When soft drinks are chosen in place of milk in school lunches, intake of protein, calcium, zinc, vitamins A and C fall, a finding seen in several previous studies^{34,39} and reiterated by Mrdjenovic and Levitsky.¹ In addition, those with the highest soft drink intakes in the diet also have the highest energy intakes.⁴⁰ Guthrie et al⁹ looked at the displacement phenomenon a different way. By examining women with adequate calcium intakes, they were able to show that these women had lower intakes of sweetened soft drinks and greater intakes of milk. Displacement can even be identified in the first 24 months of life. In the Feeding Infants and Toddler Study, Skinner et al⁴¹ found that as fruit juice, fruit drink, and carbonated drinks increased, calcium density in the diet fell. So, rather than being a consolation that fruit drinks represent the second greatest source of vitamin C among children of all ages as Park suggests, this fact is disturbing.¹³ Fortification of a sugared drink is no substitute for fruit consumption.

IS IT THE DRINK OR THE MARKETING THAT IS THE PROBLEM?

When they wrote the policy statement, the members of the AAP COSH were faced with a new marketing strategy aimed at children termed "exclusive soft drink contracts," contracts between representatives of the soft drink industry and school authorities. Fearing that one consequence of these lucrative school contracts was going to be the promotion of even greater over-consumption of sugar, the COSH recommended that pediatricians work with their local school districts to eliminate sweetened drinks from schools, substituting instead water, milk, and fruit and vegetable juices.²⁰ The committee's fears proved well founded. The recent School Health Policies and Programs Study, conducted in 2000, surveyed all 51 state education agencies, 523 school districts, 841 school food service representatives, and 927 schools about current policies. The survey showed that 49.9% of districts had a soft drink contract and that of these, nearly 80% received a specified percentage of the sales receipts. Almost two thirds of the schools were given incentives once sales achieved a specified amount. One third of the schools allowed advertising in their buildings. Of elementary schools, 58% allowed students to purchase beverages from vending machines, of middle schools 83%, and of high schools 93%.⁴² Despite current USDA guidelines to discourage sales of "foods of minimal nutritional value," which includes soft drinks, the survey found that 70% of schools allowed students to purchase them during the lunch period.

The public looks to physicians as their most trusted source for nutrition guidance.^{43,44} With their statement, the AAP COSH urged pediatricians to take an active role in shaping the second most important environment for child development, the schools. Every day 55 million children attend school, offering society an unparalleled opportunity to address their nutrition and fitness in an efficient and cost-effective way.⁴⁵ By strengthening existing programs such as the school breakfast program, the national school lunch program,

classroom nutrition instruction, daily physical fitness instruction, intramural sports, and after-school programs, we can improve the health of the nation's children. Any practices and policies that dilute these programs need to be reconsidered.^{7,45,46} To ensure that the school promotes the health of its students, each school district should draft a nutrition policy with the guidance of parents and health professionals, especially pediatricians, dietitians, and dentists. Vended and a la carte foods, school stores, fund-raisers, school parties, and booster sales at sporting events should all conform to the stated goals of the policy.

WHAT CAN WE CONCLUDE?

Obesity is a multi-factorial problem. Any recommendation that singles out one activity or dietary change can be criticized as "simplistic" and is unlikely to be effective in isolation. Yet that does not mean that factors should be ignored; the cumulative effect of many small changes across a child's environment can be synergistic. This is as true for attempts to create societal change through a public health agency, a professional organization, or a school as it is for personal change, such as that directed from a physician to a patient. It is only by making such changes, one at a time if necessary and more if possible, that we are likely to contain a problem of the magnitude of obesity.

Obesity is America's biggest threat to child health.⁴⁷ One study found that as many as 25% of obese children already showed signs of early glucose intolerance, a precursor to type II diabetes.⁴⁸ Further, it has been estimated that a child who is diagnosed with type II diabetes mellitus at age 10 years will lose between 17 and 26 life-years to the disease, depending on gender and ethnic background.⁴⁹ Not only will the duration of their lives be cut short, but the quality of their lives also will be drastically worsened by chronic disease. The psychological ramifications of early obesity, important in the near-term for young children, may last a lifetime.^{50,51} With the public now aware that obesity-related morbidity and mortality is poised to exceed that from tobacco, pediatricians have a responsibility to develop effective solutions and aggressively advocate for them.

Soft drinks are not tobacco. The majority of Americans drink them. Like other energy-dense, nutrient-poor foods, they may have a place in everyday nutrition, albeit only in moderation and, in the opinion of the AAP COSH, not in schools. To be successful in our efforts to prevent childhood obesity, we need the cooperation of the beverage, restaurant, and vended and snack foods industries. We should not make any one of them the scapegoat for obesity. On the other hand, with obesity assuming the mantle of number one preventable disease in the nation, these industries should expect pediatricians and parents to hold them accountable for marketing practices that worsen an already deleterious health situation for children.

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