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SHORT REPORT

Confectionery consumption in childhood and adult violence

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Declaration of interest

ESSENCE OF ARTICLE IS WHOLE ARTICLE

“Diet has been associated with behavioral problems, including aggression, but the long-term effects of childhood diet on adult violence have not been studied. We tested the hypothesis that excessive consumption of confectionery at age 10 years predicts convictions for violence in adulthood (age 34 years). Data from age 5, 10 and 34 years were used. Children who ate confectionery daily at age 10 years were significantly more likely to have been convicted for violence at age 34 years, a relationship that was robust when controlling for ecological and individual factors. “

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BJP 2009 195: 378. [Full Text]

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NCJ Number: NCJ 070045

Title: **Diet, Crime and Delinquency**

Author(s): A Schauss

Sale: Parker House

2340 Parker Street, Berkeley, CA 94704

Publication Date: 1980 Pages: 118

Origin: United States Language: English

Annotation: Using case histories and citations from research literature, this book argues that diet is related to juvenile delinquency as well as to adult criminal behavior.

ESSENCE OF ARTICLE IS WHOLE ARTICLE

Abstract: "Efforts to prevent crime and delinquency have focused almost exclusively on psychological and socioeconomic factors. Criminologists have largely ignored disturbed biochemical functioning as a possible cause of criminal behavior. Like alcohol or drugs, ordinary foods or the lack of them can alter the mind and unleash criminal behavior. Sugar starvation, vitamin deficiencies, lead pollution, food additives, and food allergies can convert a normal brain into a criminal mind. Numerous case histories illustrate the link between diet and such behavior problems as hyperactivity in children.

Recent prison experiences have shown that dietary change or nutrition education programs have successfully reduced disciplinary problems and improved morale. Studies of alcohol abusers and heroin addicts have shown a connection between poor eating habits and psychological problems. Diets of substance abusers, hyperactive children, and others are characterized by high intake of sugar, processed and refined foods, and junk foods. Exercise has also been shown to improve mental attitudes and behavior. Moreover, light and color affect nutrition and behavior. Thus, a substantial body of evidence indicates that diet, toxic metals, food additives, insufficient nutrients, food allergy, lack of exercise, and mal-illumination can all contribute to criminal behavior. Evidence is mounting that a good diet makes a positive difference when working with some offenders. The book recommends that, in all criminal cases, the offender's diet and metabolism should be examined before treatment is chosen, particularly for juvenile first offenders. Figures, a table, chapter reference lists and bibliographies, an index, and appendixes presenting the Nutrition Behavior Inventory and comparative nutritional intakes for 22 juvenile offenders and 22 controls are included."

Index Term(s): Crime causes/ ; Juvenile delinquency factors ; Biological influences ; Hazardous substances or materials ; Hyperactive children ; Nonbehavioral correlates of crime ; Dietary influences on behavior

To cite this abstract, use the following link:

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PMID: 12187402 [PubMed - indexed for MEDLINE]

Int J Obes Relat Metab Disord 2002 Sep;26(9):1239-44 Related Articles, Links

Intake of sweet foods and counts of cariogenic microorganisms in relation to body mass index and psychometric variables in women.

Barkeling B, Linne Y, Lindroos AK, Birkhed D, Rooth P, Rossner S.

Obesity Unit, Huddinge University Hospital, Stockholm, Sweden. Britta.Barkeling@medhs.ki.se

ESSENCE OF ARTICLES

“RESULTS: The number of mutans streptococci correlated with BMI ($P<0.05$), indirectly indicating a higher intake of sweet foods in obese women. The reported energy intake of sweet foods (more specifically the intake of chocolate), correlated with CPRS scores ($P<0.01$), indicating that women with more severe psychiatric symptomatology have higher intakes of sweet foods. CONCLUSIONS: This study suggests that women with higher CPRS score have higher energy intakes of sweet foods, indicating a possible link between mood regulation and the intake of sweet food.”

ARTICLE

OBJECTIVE: As a part of the SPAWN (Stockholm Pregnancy and Women's Nutrition) study, the intake of sweet foods (habitual and pre-menstrual intakes) and the number of cariogenic microorganisms in saliva was analyzed in relation to body mass index (BMI) and psychometric variables. DESIGN: A cross-sectional study. SUBJECTS: Three hundred and sixty-two women with a median BMI of 24.2 kg/m² (range 17.5-47.8) and 45 y of age (range 34-64). METHODS: A questionnaire of sweet food intake, salivary counts of mutans streptococci and lactobacilli and a self-rating scale on psychometric variables (CPRS-S-A). RESULTS: The number of mutans streptococci correlated with BMI ($P<0.05$), indirectly indicating a higher intake of sweet foods in obese women. The reported energy intake of sweet foods (more specifically the intake of chocolate), correlated with CPRS scores ($P<0.01$), indicating that women with more severe psychiatric symptomatology have higher intakes of sweet foods. CONCLUSIONS: This study suggests that women with higher CPRS score have higher energy intakes of sweet foods, indicating

a possible link between mood regulation and the intake of sweet food. SPONSORSHIP: Karolinska Institute Research Funds.

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<http://www.nutritionandmetabolism.com/content/6/1/10>

Schizophrenia, gluten, and low-carbohydrate, ketogenic diets: a case report and review of the literature

Bryan D Kraft and Eric C Westman

Nutrition & Metabolism 2009, 6:10doi:10.1186/1743-7075-6-10

Published: 26 February 2009

Abstract (provisional)

ESSENCE OF ARTICLE

“We report the unexpected resolution of longstanding schizophrenic symptoms after starting a low-carbohydrate ketogenic diet. After a review of the literature, possible reasons for this include the metabolic consequences from the elimination of gluten from the diet, and the modulation of the disease of schizophrenia at the cellular level.”

The complete article is available as a provisional PDF. The fully formatted PDF and HTML versions are in production.

ARTICLE

This Provisional PDF corresponds to the article as it appeared upon acceptance. Fully formatted PDF and full text (HTML) versions will be made available soon.

Schizophrenia, gluten, and low-carbohydrate, ketogenic diets: a case report and review of the literature

Nutrition & Metabolism 2009, 6:10 doi:10.1186/1743-7075-6-10

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Schizophrenia, gluten, and low-carbohydrate, ketogenic diets: a case report and review of the literature
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Case report

C.D. is a 70 year-old Caucasian female with a diagnosis of schizophrenia since the age of seventeen. Her diagnosis was based on paranoia, disorganized speech, and hallucinations. She reported both auditory and visual hallucinations, including seeing skeletons and hearing voices that told her to hurt herself. According to her history, she has had these hallucinations on almost a daily basis since the age of seven. C.D. has also been hospitalized at least five times over the last six years for suicide attempts and increased psychotic symptoms. She has attempted to overdose on medications, cut herself, and ingest cleaning agents. Her most recent hospitalization was five months prior to initiating the low-carbohydrate diet. She has discussed both her suicidal ideations and her hallucinations with her psychiatrist who has tried to optimize her medication regimen in an effort to improve her symptoms, but this has been largely unsuccessful. Her prior anti-psychotic and mood-stabilizing medication regimen has included lithium 900 mg qhs, olanzapine (dose unknown), ziprasidone 40 mg bid, aripiprazole 30 mg qhs, lamotrigine 100 mg bid, and quetiapine 900 mg qhs. She is currently managed on risperidone 4 mg qhs.

C.D.'s other medical problems (and approximate year of diagnosis) included obesity (1950's), hypertension (1970's), depression (1940's), obstructive sleep apnea (2002), gastroesophageal reflux disease (2003), urinary incontinence (2002), glaucoma (1999), trochanteric bursitis (2004), peripheral neuropathy of unknown etiology (2006), and prior cholecystectomy (1978). Her current medications included atenolol 100 mg daily, furosemide 20 mg daily, trazodone 100 mg qhs, sertraline 100 mg daily, timolol eye drops 1 drop each eye bid, brimonidine eye drops 1

drop each eye bid, and vitamin E 400 IU every other day.

A typical day's diet consisted of the following: egg and cheese sandwich, diet soda, water, pimento cheese, barbequed pork, chicken salad, hamburger helper, macaroni and cheese, and potatoes. She rated her baseline fatigue as a "3" using a standardized questionnaire (0=none, 4=severe or frequent). Her body weight was 141.4 kilograms (BMI 52.6 kg/m²), sitting blood pressure (BP) was 130/72 mmHg, and pulse was 68 beats per minute. Physical examination showed an obese, mildly disheveled female with poor attention to hygiene, but was otherwise unremarkable. She was instructed how to follow a dietary regimen consisting of unlimited meats and eggs, 4 ounces of hard cheese, 2 cups of salad vegetables, and 1 cup of low-carbohydrate vegetables per day. This diet restricts carbohydrate intake to fewer than 20 grams per day [1].

She returned for a follow-up appointment 7 days after starting the low-carbohydrate diet. She was feeling well, and noted an increase in energy. She was seen again in clinic 19 days later. When asked how she was doing, she responded that she was no longer hearing voices or seeing skeletons. She first noticed this upon awakening about 8 days after starting the program. She had had no change in medication. The only change had been in her dietary intake which now consisted of beef, chicken, turkey, ham, fish, green beans, tomatoes, diet drinks, and water. She denied hunger. C.D. was very happy that she was no longer hearing voices, and believed that it made her calmer. Her body weight was 136.2 kilograms, sitting BP was 150/84 mmHg, and pulse was 76 beats per minute.

Over the course of 12 months, C.D. has continued the low-carbohydrate, ketogenic diet and has had no recurrence of her auditory or visual hallucinations. She has also continued to lose weight

Discussion

In this case study, the abrupt resolution of longstanding schizophrenic symptoms was observed after the initiation of a low-carbohydrate, ketogenic diet used for weight loss. Previously, Dohan observed a decrease in hospital admissions for schizophrenia in countries that had limited bread consumption during World War II, which suggested a possible relationship between bread and schizophrenia [2]. Dohan and colleagues also observed that overt schizophrenia was rare in remote tribal areas of several South Pacific islands where grains were rare, as compared to similar populations which had a higher prevalence of overt schizophrenia and grain consumption [3]. Additionally, some researchers have previously noted an association between schizophrenia and celiac disease, an immune-mediated enteropathy that is triggered by the ingestion of glutencontaining grains [4].

The treatment of schizophrenia today is largely pharmacological, but we found several treatments previously used or studied related to nutritional factors. There have been several small controlled studies in which a gluten-free diet showed promise in ameliorating schizophrenic symptoms [4]. In one such study, approximately 10% of schizophrenic patients had improvement in their symptoms by elimination of dietary gluten [5]. Another uncontrolled pilot study using a ketogenic diet (which is typically also a gluten-free diet because the consumption of gluten-containing bread and starch is eliminated) also suggested symptomatic improvement among patients with schizophrenia [6]. This study was motivated by the observation that patients with schizophrenia tended to eat more carbohydrates immediately before a psychotic episode. Additionally, low-carbohydrate, ketogenic diets have a long history for the treatment of refractory pediatric epilepsy [7, 8] and recently have been studied as a treatment for obesity and cardiometabolic risk reduction [9, 10]. The mechanism of action for the anti-epileptic effect may be related to an increase in GABA activity which leads to a general

reduction in excitation [11]. Ketosis was not confirmed in C.D. after starting the lowcarbohydrate, ketogenic diet. While checking serum or urinary ketones may have provided more information to C.D.'s current metabolic state, ketosis itself may be more effect than cause if the underlying process is indeed an immune-mediated reaction to gluten. Still, this is a limitation to this report.

The diagnosis of celiac disease is often difficult to make, but serologic tests are available to assist in the diagnosis. In C.D.'s case, an anti-gliadin IgG assay was performed and was 13 units (negative < 20 units). While the assay was negative, it was limited by the fact that it was performed 3 months after the initiation of the low carbohydrate diet and thus in the absence of an antigenic stimulus. Additionally, biopsy-proven celiac disease without serological evidence is a known clinical entity [12].

Dietary conditions other than gluten-sensitivity, such as vitamin deficiencies, have also been associated with psychosis and schizophrenia. For example, deficiencies in folate, vitamin C, and niacin have been suggested to worsen the symptoms of schizophrenia [13]. Furthermore, one study examining the nutritional content of a low carbohydrate diet found that while there was similar intake of other vitamins and minerals, the consumption of fiber and vitamin C was less in the low carbohydrate diet compared to a low fat diet [14]. In C.D.'s case, she reported consuming sources of vitamin C (tomatoes) in her diet history, and her prescribed diet allowed for her to consume other vitamin C rich foods as well (i.e. squash). Still, had she consumed less than the recommended intake of vitamin C, her symptoms should have worsened instead of improved. It is also unlikely that she would become overtly deficient in vitamin C after 8 days, which is when her symptoms changed. The same argument can be made for folate; because the majority of folic acid is found in fortified breads and grains, it is logical to assume then that initiating a gluten-free diet would have worsened her symptoms, and not improved them. Moreover, the previously studied doses of niacin (3 g/day) and methylfolate (15 mg/day) in patients with schizophrenia to achieve clinical improvement are far greater than what would be consumed in a typical low carbohydrate diet [15, 16]. Finally, patients with schizophrenia have been shown to consume less fiber than the general U.S. population [17], but there is no data to suggest that altering the fiber content of a diet will change the symptoms of patients with schizophrenia.

Conclusion

While more research is needed to confirm the association between gluten intake and schizophrenia and whether dietary change can ameliorate schizophrenic symptoms, health care providers could consider screening patients with schizophrenia for celiac disease and/or augment the medical regimen with a gluten-free or low-carbohydrate, ketogenic diet.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

EW conceived of the report, obtained the patient's history and physical exam and drafted the manuscript. BK participated in the patient's history and physical exam, and drafted the manuscript. All authors read and approved the final manuscript.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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<http://www.nytimes.com/2005/02/09/dining/09well.html?oref=login>

EATING WELL

Selling Wholesomeness in the Breakfast Bowl

Andrew Scrivani for The New York Times

JUST ADD MILK A serving of original Cheerios, has three grams of fiber. Frosted Cheerios has none.

By MARIAN BURROS

Published: February 9, 2005

Chart

Do Grains Make a Difference?

Fiber content before and after General Mills made all of its breakfast cereals whole grain.

ESSENCE OF ARTICLE

"It's important for people to realize that using whole grains in breakfast cereals does not turn them into health foods," she said. "Many are still breakfast candy, almost half sugar."

ARTICLE

NUTRITIONISTS and researchers have reacted positively to the news that General Mills has added whole grains to breakfast cereals that did not include them before. But the praise is not without reservation: the fiber content of many of the cereals has increased very little, if at all.

"Whole grains" are buzz words for 2005. One market research firm, Mintel, has declared them the ingredient of the year. On Monday, Post cereals announced its lineup of whole grain cereals. The rush brings back memories of the late 1980's and the oat bran craze, which lost steam as soon as oat bran potato chips appeared on the market.

But whole grains are different. They are not unnatural additions to food, the way oat bran was for most products. White flour did not become popular until after the Civil War, when the invention of the steel roller mill made the refining process cheap. But the process of refining grains strips them of much of their vitamin, mineral and fiber content. That is why ready-to-eat cereals are fortified with many - though not all - of those lost vitamins and minerals. Fiber is not added back.

The whole grain movement received an important boost when the federal dietary guidelines, released last month, suggested that half of the recommended grain servings consumed by Americans be whole grains, particularly because of their fiber content. Whole grains now make up only 5 percent of the grains eaten by Americans.

But based on information appearing on two General Mills Web sites, 28 of the company's 52 cereals contain the same level of fiber they had previously; two have one gram less than they had before the reformulation; and 14 have moved up one gram, with 11 of those going to one from zero. In fact, a total of 22 cereals have just one gram of fiber. Five cereals still have no fiber: Boo Berry, Frosted Chex, Honey Nut Chex, Franken Berry and Shrek. Cereals that were always 100 percent whole grain - like Total, Wheat Chex and Wheaties - would not be expected to have more fiber.

The information on the "before" cereals came from a General Mills Web site, www.bellinstitute.com/nutrition/pn/all.htm, which a company spokeswoman said was five years out of date and has been shut down. She refused to provide numbers for any of the cereals as they were before the reformulation. Current nutritional figures are available at www.generalmills.com/corporate/brands.

Only 24 of the current cereals contain two or more grams of fiber and would meet the standards of the Whole Grains Council, a trade association dedicated to increasing the consumption of whole grains. According to the council's Web site, www.wholegrainscouncil.org, "a true whole grain product will have at least two grams of fiber per serving and often four to five grams or more." The General Mills cereal with the most fiber in a serving is Fiber One, with 14 grams in a half cup serving.

If there is a choice between refined grains and whole grains, whole grains are indeed better, and the new versions of the General Mills cereals contain some of those other important missing micronutrients - antioxidants, phytochemicals or disease fighting plant chemicals - and minerals like selenium and

chromium, which can reduce the risk of heart disease, may help in weight maintenance and may reduce the risk of diabetes and other chronic illnesses.

"It's a step in the right direction," said Dr. Meir Stampfer, a professor of epidemiology and nutrition at the Harvard School of Public Health.

Bonnie Liebman, the director of nutrition at the Center for Science in the Public Interest, a nutrition advocacy group, which is often critical of government and the food industry, also considers the reformulation of the cereal an improvement. But she does not want people to think that the use of whole grains has magically made the cereals an excellent source of nutrition.

"It's important for people to realize that using whole grains in breakfast cereals does not turn them into health foods," she said. "Many are still breakfast candy, almost half sugar."

The cereal company wants the public to be aware that it is selling whole grains, not fiber. Susan Crockett, the senior director at the Bell Institute of Health and Nutrition of General Mills, said she knows that some people, including health professionals "think whole grain and fiber are the same thing." But she said the benefits of whole grain have to do with "the synergy of the components."

The company's Web site makes the case again, stating, "whole grain is more than fiber."

Dr. Joanne L. Slavin, a professor of food science and nutrition at the University of Minnesota, said the absence of significant levels of fiber "is a bit of a disconnect because people look for fiber, and when they don't see it, it's confusing." She added: "If this stuff is mostly sugar, we are potentially confusing or misleading people if they think it's totally healthy. But it's probably better than a crummy Danish that's been sitting in the package for three weeks."

Dr. Slavin said she has worked with General Mills and likes the whole grain message, but she said, "I'm also a fiber person, and I'd like those whole grains to have more fiber in them."

The level of fiber in whole grains is dependent on the variety: whole wheat and oats naturally have more fiber than brown rice. But the level of whole grains in a ready-to-eat cereal, no matter the brand, is also dependent on the sugar content. The more sugar, the less grain and fiber. Just compare the various kinds of Cheerios: a 30 gram (about an ounce) serving of unsweetened Cheerios contains one gram of sugar, three grams of dietary fiber; the same size serving of the sweetened Apple Cinnamon Cheerios and Frosted Cheerios, each with 13 grams of sugar, contains just one gram of fiber.

Dr. Barbara Schneeman, the director of nutrition products, labeling and dietary supplements at the Food and Drug Administration, said, "the reason to include whole grain products in the diet is to increase the fiber content." She suggested that consumers check under daily value in the far right column of a package's nutrition facts panel to find out if a food is high or low in fiber. "If the daily value is 5 percent fiber, that is low," she explained, while "20 percent or more is high. Look at the fiber content and the added sugar content, and then make comparisons."

The guidelines recommend 28 grams of fiber for most women daily, 35 for most men.

Though the Food and Drug Administration has not established a definition for good and excellent sources of whole grain, General Mills says cereals that have 8 to 16 grams of whole grains can be called good

sources. And those that have 16 or more grams of whole grains can be called excellent, which is how the company describes the cereals on its labels.

A spokeswoman for the Food and Drug Administration said that it "would have to look at the entire package and context in which it appears to see if the statements are false and misleading." Last May, General Mills asked the agency to create a federal standard based on the levels the company is using.

Whether General Mills cereals are good or excellent sources of nutrition, Dr. Stampfer of Harvard said that adding whole grains to a cereal like Trix "doesn't make Trix a health food." He added: "I hope I am not being interpreted saying that Trix is a good healthy choice for eating. Would I recommend Trix compared to steel-cut oats as a choice for breakfast? No."

<http://www.nancyappleton.com/>

124 Ways Sugar Ruins Your Health

By Nancy Appleton, PhD

Print this list and tape it to your refrigerator or sugar bowl. (See below for clinical documentation of each statement.)

1. Sugar can suppress the immune system.
2. Sugar upsets the mineral relationships in the body.
3. Sugar can cause hyperactivity, anxiety, difficulty concentrating, and crankiness in children.
4. Sugar can produce a significant rise in triglycerides.
5. Sugar contributes to the reduction in defense against bacterial infection (infectious diseases).
6. Sugar causes a loss of tissue elasticity and function, the more sugar you eat the more elasticity and function you lose.
7. Sugar reduces high density lipoproteins.
8. Sugar leads to chromium deficiency.
9. Sugar leads to cancer of the breast, ovaries, prostate, and rectum.
10. Sugar can increase fasting levels of glucose.
11. Sugar causes copper deficiency.
12. Sugar interferes with absorption of calcium and magnesium.
13. Sugar can weaken eyesight.
14. Sugar raises the level of neurotransmitters: dopamine, serotonin, and norepinephrine.

15. Sugar can cause hypoglycemia.
16. Sugar can produce an acidic digestive tract.
17. Sugar can cause a rapid rise of adrenaline levels in children.
18. Sugar malabsorption is frequent in patients with functional bowel disease.
19. Sugar can cause premature aging.
20. Sugar can lead to alcoholism.
21. Sugar can cause tooth decay.
22. Sugar contributes to obesity.
23. High intake of sugar increases the risk of Crohn's disease, and ulcerative colitis.
24. Sugar can cause changes frequently found in person with gastric or duodenal ulcers.
25. Sugar can cause arthritis.
26. Sugar can cause asthma.
27. Sugar greatly assists the uncontrolled growth of Candida Albicans (yeast infections).
28. Sugar can cause gallstones.
29. Sugar can cause heart disease.
30. Sugar can cause appendicitis.
31. Sugar can cause multiple sclerosis.
32. Sugar can cause hemorrhoids.
33. Sugar can cause varicose veins.
34. Sugar can elevate glucose and insulin responses in oral contraceptive users.
35. Sugar can lead to periodontal disease.
36. Sugar can contribute to osteoporosis.
37. Sugar contributes to saliva acidity.
38. Sugar can cause a decrease in insulin sensitivity.
39. Sugar can lower the amount of Vitamin E in the blood.
40. Sugar can decrease growth hormone.

41. Sugar can increase cholesterol.
42. Sugar can increase the systolic blood pressure.
43. Sugar can cause drowsiness and decreased activity in children.
44. High sugar intake increases advanced glycation end products (AGEs)(Sugar bound non-enzymatically to protein)
45. Sugar can interfere with the absorption of protein.
46. Sugar causes food allergies.
47. Sugar can contribute to diabetes.
48. Sugar can cause toxemia during pregnancy.
49. Sugar can contribute to eczema in children.
50. Sugar can cause cardiovascular disease.
51. Sugar can impair the structure of DNA
52. Sugar can change the structure of protein.
53. Sugar can make our skin age by changing the structure of collagen.
54. Sugar can cause cataracts.
55. Sugar can cause emphysema.
56. Sugar can cause atherosclerosis.
57. Sugar can promote an elevation of low density lipoproteins (LDL).
58. High sugar intake can impair the physiological homeostasis of many systems in the body.
59. Sugar lowers the enzymes ability to function.
60. Sugar intake is higher in people with Parkinson's disease.
61. Sugar can cause a permanent altering the way the proteins act in the body.
62. Sugar can increase the size of the liver by making the liver cells divide.
63. Sugar can increase the amount of liver fat.
64. Sugar can increase kidney size and produce pathological changes in the kidney.
65. Sugar can damage the pancreas.
66. Sugar can increase the body's fluid retention.

67. Sugar is enemy #1 of the bowel movement.
68. Sugar can cause myopia (nearsightedness).
69. Sugar can compromise the lining of the capillaries.
70. Sugar can make the tendons more brittle.
71. Sugar can cause headaches, including migraine.
72. Sugar plays a role in pancreatic cancer in women.
73. Sugar can adversely affect school children's grades and cause learning disorders..
74. Sugar can cause an increase in delta, alpha, and theta brain waves.
75. Sugar can cause depression.
76. Sugar increases the risk of gastric cancer.
77. Sugar and cause dyspepsia (indigestion).
78. Sugar can increase your risk of getting gout.
79. Sugar can increase the levels of glucose in an oral glucose tolerance test over the ingestion of complex carbohydrates.
80. Sugar can increase the insulin responses in humans consuming high-sugar diets compared to low sugar diets.
- 81 High refined sugar diet reduces learning capacity.
82. Sugar can cause less effective functioning of two blood proteins, albumin, and lipoproteins, which may reduce the body's ability to handle fat and cholesterol.
83. Sugar can contribute to Alzheimer's disease.
84. Sugar can cause platelet adhesiveness.
85. Sugar can cause hormonal imbalance; some hormones become underactive and others become overactive.
86. Sugar can lead to the formation of kidney stones.
87. Sugar can lead to the hypothalamus to become highly sensitive to a large variety of stimuli.
88. Sugar can lead to dizziness.
89. Diets high in sugar can cause free radicals and oxidative stress.

90. High sucrose diets of subjects with peripheral vascular disease significantly increases platelet adhesion.
91. High sugar diet can lead to biliary tract cancer.
92. Sugar feeds cancer.
93. High sugar consumption of pregnant adolescents is associated with a twofold increased risk for delivering a small-for-gestational-age (SGA) infant.
94. High sugar consumption can lead to substantial decrease in gestation duration among adolescents.
95. Sugar slows food's travel time through the gastrointestinal tract.
96. Sugar increases the concentration of bile acids in stools and bacterial enzymes in the colon. This can modify bile to produce cancer-causing compounds and colon cancer.
97. Sugar increases estradiol (the most potent form of naturally occurring estrogen) in men.
98. Sugar combines and destroys phosphatase, an enzyme, which makes the process of digestion more difficult.
99. Sugar can be a risk factor of gallbladder cancer.
100. Sugar is an addictive substance.
101. Sugar can be intoxicating, similar to alcohol.
102. Sugar can exacerbate PMS.
103. Sugar given to premature babies can affect the amount of carbon dioxide they produce.
104. Decrease in sugar intake can increase emotional stability.
105. The body changes sugar into 2 to 5 times more fat in the bloodstream than it does starch.
106. The rapid absorption of sugar promotes excessive food intake in obese subjects.
107. Sugar can worsen the symptoms of children with attention deficit hyperactivity disorder (ADHD).
108. Sugar adversely affects urinary electrolyte composition.
109. Sugar can slow down the ability of the adrenal glands to function.
110. Sugar has the potential of inducing abnormal metabolic processes in a normal healthy individual and to promote chronic degenerative diseases.
- 111.. I.Vs (intravenous feedings) of sugar water can cut off oxygen to the brain.
112. High sucrose intake could be an important risk factor in lung cancer.

113. Sugar increases the risk of polio.
 114. High sugar intake can cause epileptic seizures.
 115. Sugar causes high blood pressure in obese people.
 116. In Intensive Care Units: Limiting sugar saves lives.
 117. Sugar may induce cell death.
 118. Sugar may impair the physiological homeostasis of many systems in living organisms.
 119. In juvenile rehabilitation camps, when children were put on a low sugar diet, there was a 44% drop in antisocial behavior.
 120. Sugar can cause gastric cancer.
 121. Sugar dehydrates newborns.
 122. Sugar can cause gum disease.
 123. Sugar increases the estradiol in young men.
 124. Sugar can cause low birth-weight babies.
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ESSENCE OF ARTICLE

“In a study of 8,000 teenagers at nine juvenile correctional facilities, Schoenthaler arranged to have diets high in sugar and other refined carbohydrates replaced with diets high in fruits, vegetables, and whole grains. The change was attributed to budget cuts, so inmates did not realize they were in an experiment. During the year in which diets were changed, violent and antisocial incidents in the institutions decreased by almost half. “

“In the 1980s, Schoenthaler was involved in a study that changed the nutritional content of school lunches served to 1.1 million New York City public school students. In just one year, a more wholesome diet led to a 16 percent increase in academic performance and a 41 percent decrease in learning disabled children.”

“How have prison authorities responded to Schoenthaler's research? At one institution, switching from processed to natural foods reduced the food budget by 39 percent. But sometimes good news can be embarrassing. In Alabama, dietary improvements at a juvenile facility led to impressive reductions in antisocial behavior. "But the authorities didn't like the findings because it showed that they had been

previously warehousing kids, not rehabilitating them," Schoenthaler explained at the 15th International Conference on Human Functioning, held last fall in Wichita, Kansas. “

Mean Streets or Mean Minerals?

Nutritional deficiencies and imbalances can impair brain function and set the stage for delinquent and criminal behavior.

Experts have found that the right supplements can improve behavior.

By Jack Challem

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Some 30 years ago, when Bill Walsh, Ph.D., was working as a scientist at Argonne National Laboratory and doing volunteer work at Illinois' Stateville Prison, he asked himself: why would one brother become a law-abiding citizen and the other a lifelong criminal?

People have asked themselves the same question for thousands of years, going back at least to the Biblical story of Cain and Abel. "I had always believed people were the result of their life experiences," Walsh says. "But in working with prisoners and their families, I found Brady Bunch families with a criminal son."

The contradiction sent Walsh on a journey that, with synchronicity, led him to the late Carl Pfeiffer, M.D., Ph.D., a nutritionally oriented physician. Pfeiffer understood how levels of essential and toxic metals could affect behavior, and he suggested that Walsh, an analytical chemist, was well suited to further investigate the problem.

Back in the 1970s, with other Argonne scientists and state-of-the-art analytical equipment, Walsh studied mineral levels in the hair of 24 pairs of brothers. In each case, one brother was "good" and the other was a "boy from hell." Mineral levels in the hair, explains Walsh, reflect those of the rest of the body.

The results stunned him. The good-natured boys had normal mineral levels, but the delinquents had two distinctive mineral patterns: One pattern consisted of very high copper and very low zinc, sodium, and potassium; the other consisted of very low zinc and copper and very high sodium and potassium. Most of the troublemakers also had lead and cadmium levels three times higher than those of their well-behaved brothers.

Walsh found the same mineral patterns in a group of 192 adults, half incarcerated criminals and half law-abiding adults. He also found specific behavioral traits that matched each mineral pattern. People with the first pattern would repeatedly lose their temper "like a volcano going off," and later feel remorse. People with the second mineral pattern never seemed to have a good day, were mean and cruel, oppositionally defiant, had no remorse, and would have been described as sociopathic.

Mineral Metabolism Disorder

"It turned out that the violent kids were born with a metal metabolism disorder, an inability to properly manage trace minerals," Walsh explains. "This disorder is related to poor metallothionein activity in the gut." Metallothionein, a protein needed for the absorption of zinc, also plays key roles in detoxifying hazardous metals, such as lead and cadmium. Often, metallothionein levels can be boosted with supplemental zinc and other minerals.

In 1981, Walsh founded the Health Research Institute as a nonprofit corporation, and five years later he left Argonne to pursue his newfound passion full time. Today, the Naperville, Ill., complex consists of the research institute, the Pfeiffer Treatment Center, and a compounding pharmacy for patients. The staff includes three physicians and eight nurses. Walsh is the center's chief scientist.

Walsh can tell stories that would make a Stephen King novel seem tame. Over the years, he has conducted hair mineral analysis of 28 serial killers and mass murders, including Charles Manson. All of them fell into the two abnormal mineral patterns, with lead and cadmium levels typically being elevated. Manson had one of the most extreme mineral patterns among the 14,000 patients in the center's database. "Manson always blamed his behavior on how he grew up," says Walsh. "But based on the mineral analysis, he would have been that way regardless of how he was brought up."

However, the overall focus of the Health Research Institute and Pfeiffer Treatment Center, is on treating less chilling behavioral disorders in children and adults. The center works with patients who have violent and delinquent behavior, attention-deficit disorder, autism, depression, bipolar disorder, and schizophrenia. Interestingly enough, some well-known but temperamental professional sports figures have also been treated here.

Walsh recently analyzed 207 consecutive (i.e. random) patients diagnosed with behavioral disorders, including temper tantrums, destructive behavior, and assaults, all of whom were and treated nutritionally at the Pfeiffer Treatment Center. Ninety-two percent of the assaultive patients who followed their prescribed diet and took supplements improved, and 58 percent completely eliminated this type of behavior. Similarly, 80 percent of destructive patients improved, 53 percent completely; and 92 percent of those having verbal outbursts got better, 11 percent completely.

Prison Studies with Diet and Vitamins

Like Walsh, Stephen J. Schoenthaler, Ph.D., a sociology professor at the Stanislaus campus of California State University, near Turlock, has also found powerful link between nutrients and behavior. Originally a skeptic, 20 years of studies have made Schoenthaler a believer in the benefits of nutrition and supplements. His conclusion: "People should be responsible for what they eat, just like they are held responsible for when they drink and drive," he says.

Schoenthaler and his colleagues have studied nutrition and behavior at juvenile and adult correctional facilities and in public schools. Sometimes the results have been startling. For example, one study of juvenile delinquents and adult felons in five states found that the "offenders with the worst behavior consumed the least vitamins and minerals." In California prisons, convicts with up to four nutritional deficiencies were 50 percent more likely to be involved in serious violent incidents, and those with five to nine nutrient deficiencies were 90 percent more likely to be involved in such incidents.

In a study of 8,000 teenagers at nine juvenile correctional facilities, Schoenthaler arranged to have diets high in sugar and other refined carbohydrates replaced with diets high in fruits, vegetables, and whole grains. The change was attributed to budget cuts, so inmates did not realize they were in an experiment. During the year in which diets were changed, violent and antisocial incidents in the institutions decreased by almost half.

In the 1980s, Schoenthaler was involved in a study that changed the nutritional content of school lunches served to 1.1 million New York City public school students. In just one year, a more wholesome diet led to a 16 percent increase in academic performance and a 41 percent decrease in learning disabled children.

Schoenthaler has achieved similar results simply by adding a common once-daily vitamin/mineral supplement to the diets of delinquents, adult felons, and ordinary elementary school children. In one investigation, people receiving a multivitamin/mineral supplement displayed less antisocial or violent behavior, compared with those receiving a placebo. "The most common vitamins to be low among children whose conduct and academic performance improved after nutritional intervention are pyridoxine, folic acid, thiamine, niacin, and vitamin C," he says.

How have prison authorities responded to Schoenthaler's research? At one institution, switching from processed to natural foods reduced the food budget by 39 percent. But sometimes good news can be embarrassing. In Alabama, dietary improvements at a juvenile facility led to impressive reductions in antisocial behavior. "But the authorities didn't like the findings because it showed that they had been previously warehousing kids, not rehabilitating them," Schoenthaler explained at the 15th International Conference on Human Functioning, held last fall in Wichita, Kansas.

The Role of Food Allergies

When working with juvenile patients, psychiatrist Priscilla Slagle, M.D., of Palm Springs, Calif., sees irritability, anger, and aggressiveness as common signs of food allergies. Slagle, author of *The Way Up from Down* (Random House, 1987), a classic book on how nutrition can improve depression, points out that people are often addicted to the same foods they are allergic to. People can self-test themselves simply by avoiding suspect foods, such as wheat or dairy, for a couple of weeks and seeing if they feel better.

"I would also look at the overall quality of the side, aside from allergies, and for signs of blood sugar instability," explains Slagle. "Because patient compliance is often an issue with teenagers, it may be easier for them to take supplements than to change the diet. Among the supplements that might be helpful: B complex, calcium/magnesium, and 5-HTP (hydroxy tryptophan).

For the average stressed-out person - not a delinquent or criminal - Slagle advises limiting caffeine intake to one serving daily, and cutting out sugar, white flour food products, and alcohol for three to four weeks - "just to see if these changes make a difference."

Think Zinc?

Nutritional deficiencies, mineral-metabolism disorders, and food allergies may all be at play in delinquent and criminal behavior. But it's hard not to be drawn back to Walsh's elegant research on mineral imbalances and deficiencies. While it may not be fair to make a sweeping generalization, zinc levels do

seem to be consistently low among habitual criminals. The body needs zinc to make four metallothionein compounds, which play crucial roles in brain maturation during infancy and in protecting against brain-damaging metals, such as lead and cadmium.

In his most recent finding, Walsh found that children with autism have very high copper levels relative to zinc. He says that such a ratio reflects poor metallothionein function that, during infancy, would increase susceptibility to lead, cadmium, and even mercury poisoning. The idea is intriguing, and it might explain why infant vaccinations have sometimes triggered autism, says Walsh. Mercury is used to preserve vaccines.

The bottom line in all this: bad behavior - and a mean streak - may be more the result of mean minerals than mean streets. Looking to the future, Walsh believes that measuring mineral patterns in children might identify those at risk of becoming delinquents and criminals - at a time when dietary changes can be easily made.

Related Article: Cases from the File

Bill Walsh, Ph.D., of the Pfeiffer Treatment Center, says that each patient is prescribed an individually tailored dietary and supplement program. Because of this, we've avoided the specifics because they might not be suited to everyone.

Michael, 15 years old, had been incarcerated in an East Coast residential facility for violent behavior. Reluctantly, officials allowed him to receive an individualized vitamin/mineral supplement program from the Pfeiffer Treatment Center. After one month on the program, he felt better, more athletic, and less violent. By the second month he was symptom free, and he was released after one more month.

Cory, 5 years old, the son of a convict, was verbally abusive and threatened to burn his mother's hand and chop off her head. Tests indicated numerous nutritional deficiencies and imbalances, including an inborn defect in zinc and vitamin B6 metabolism called pyroluria. After treatment with individually tailored vitamin and mineral supplements, he became more loving, contemplative, and better able to deal with stressful situations.

Albert, at age three was killing hamsters and a year later killed the family's pet cat, showing no remorse. He hit his sister in the face with a brick and threatened to kill his mother. After taking vitamin and mineral supplements for 10 months, he was doing exceptionally well at school, was accepted into the scouts, and had no behavioral problems.

Ludwig von Beethoven wasn't a criminal, but the 18th-century composer did suffer a variety of physical health problems. Some researchers believed these health problems were the result of mercury treatments for venereal disease. Last year, Walsh analyzed minerals in a lock of Beethoven's hair. It contained extraordinarily high levels of lead.

Additional Resources: The Pfeiffer Treatment Center, www.hriptc.org and Dr. Priscilla Slagle, www.thewayup.com.

The information provided by Jack Challem is strictly educational and not intended as medical advice. For diagnosis and treatment, consult your physician.

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<http://1phil4everyill.wordpress.com/2008/11/20/dr-russell-blaylock-nutrition-and-behavior/>

November 20, 2008

Dr Russell Blaylock – Nutrition and Behavior

ESSENCE OF ARTICLE

“Crime and Nutrition”

1. Probation Violations: 56% while on a bad diet (junk food, lots of sugar); 8% while on a healthy diet
2. In particular, probation violation by using narcotics. 47% while on a bad diet; 13% on healthy diet
3. Dramatic reduction in suicides with improved diet
4. Alabama Prison systems, change of diet:
 - 42% reduction in criminal events
 - 61% reduction in antisocial behavior at one year
5. Case of Raymond who attempted murder of girlfriend
 - Age 4 - spells of weakness so mother gives him a bit of sugar
 - Age 13 – radical mood swings, his grades begin to fail
 - Age 23 – attempts murder
 - Diet: junk foods, donuts, pastries, candy and coffee
 - After diet change – no further criminal activity
6. Study of prison systems in 5 states
 - Adult felons had deficiencies of Mg, Zn, folate or B6
 - Violent offenders had 5 – 9 deficiencies in all 5 states. “The more violent the more deficient.”
7. Oklahoma Children’s Center
 - Change of diet resulted in 43% reduction in serious crime.

Elimination of high fat and sucrose in diet.

8. Brain Wave abnormalities (EEG) in felons
 - o Went from 14 to 2 abnormalities in those with serious offenses through supplementation
 - o In one child went from 6 to 0 abnormalities by giving a vitamin
 - o Even marginal deficiencies could cause criminal behavior to surface. “

ARTICLE

Tags: ADHD, Alcoholism, Alzheimer's disease, Anti-depressants, Aspartame, Crime, Criminal Behavior, Depression, Diabetes, dopamine, Dr Russell Blaylock, Free Radicals, Health, Health Food, Hyperactive, Hyperactivity, Hypoglycemia, Hypoglycemic, Junk Food, Lou Gehrig's Disease, Metabolism, MSG, Neurotransmitters, Nutrition, Obesity, Parkinson's Disease, Russell Blaylock, Schizophrenia, Schizophrenic, Serotonine, SSRI, Sugar Rush, Suicide, Suididal Thoughts

Dr Russell Blaylock Nutrition and Behavior

This blog offers background and supportive material to the topics raised in the video above. References are normally either put in place or added as footnotes, in case of controversy, I've added references in place as well as a footnote. The sources of the pictures not extracted from Blaylock's lecture are accessible by clicking. All references present in this blog were added by me that were not explicitly supplied with the Blaylock video. My own occasional commentary will be given between square brackets, [like so].

Nutrition and Genes

Nutrition controls what genes are operative or not. Mothers help determine the character of the life of children already in the womb, depending on the quality of the food this can go either in a good direction or bad direction.[1][2]

Nutrition as fuel for the brain

1. The nervous system is the most metabolically active organ in the body. It's metabolism never ceases.
2. Because of its high metabolism, the brain produces a lot of free radicals and lipid peroxidation generation. Neurodegenerative diseases (Alzheimer, Parkinson, Lou Gehrig's Disease, etc...) are characterized by high free radical generation, high lipid peroxidation.
3. The brain consumes 20% of all oxygen in the blood, 25% of all the glucose in the blood while being only 2% of the body weight. [this article even claims 60%]
4. Every component of the brain is constantly being replaced. Some lipids are replaced weekly.

Nutrition and behavior

1. 1910 – George M Gould, MD, first mentioned connection between diet and behavior.
2. 1935 – recognized that hypoglycemia could imitate anxiety neurosis, hysteria, neurasthenia, and even psychosis.
3. 1973 – Dr Wendel and Beeb found 74% incidence of hypoglycemia with anxiety associated with schizophrenia.[3]

Hyperactivity-Behavior Connection

1. 60% of members of families with hyperactive children have diabetes, obesity or alcoholism.... all sugar consumption problems.
2. 75% of prisoners were hyperactive as children [both sources give numbers of 50% though]
3. How excessive sugar consumption triggers hyperactivity [4]:

Selenium and Behavior

1. Deficiencies cause depression and confusion [preconceptual care]
2. High selenium supplementation (227 ug/d) saw significant improvement in mood.
3. Major role in brain function

Sugar Consumption and Behavior

1. 1900 Americans consumed 4 pounds of sugar a year
2. Now 129 pounds a year, 2500% increase [actually in 1999 it was already at 159 pounds a year]
3. 57% of this comes from processed foods
4. Leading source is fruit juices and sodas (43%)
5. Since 1974 consumption of sodas has doubled
6. Teenagers are drinking an equivalent of 54 teaspoons of sugar a day (nutritionists say not more than 10 teaspoons a day)
7. Adults age 40-59 increased intake of soft drinks 250% between 1972 and 2001
8. Over age 60+ increased 300%
9. Sugar makes the body age faster. People with a high calorie diet have more Alzheimer's disease than normal people.
10. Estimated that 50% of people have reactive hypoglycemia

Hypoglycemia and Aggression

1. Strong connection between alcohol abuse, hypoglycemia and criminal behavior

97% of alcoholics are hypoglycemic vs 18% of controls are hypoglycemic

2. When hypoglycemia is treated:

71% attain sobriety

25% for Alcoholics Anonymous

3. Associated with aggression, especially those with temporal lobe dysfunction.
4. Indians of Peru – 55% hypoglycemia and aggression very high
5. Aspartame and MSG both stimulate insulin release from the pancreas and induce hypoglycemia and thus stimulates actual weight-gain.
6. MSG induces intense rage with micro-injections into the hypothalamus
7. In presence of hypoglycemia, MSG induced excito-toxicity is greatly magnified
8. Several amino-acids can make you hypoglycemic: taurine, glutamine, isoleucine, leucine... the latter kind kills babies (sudden death) and it can kill adults

Research

1. Virkkunen 1983 Study of violent offenders in prison
 - o In impulsive violent offenders, blood sugar fell suddenly and rose quickly after a glucose challenge
 - o Antisocial offender had a fall in blood sugar that was slow to rise
2. Ron Prinz University of Florida 1980
 - o First to study effects of sugar in children
 - o Children ate 40% of calories as sugar
 - o The highest consumers of sugar (top 25%) demonstrated significantly poorer measures on attentiveness (hyperactive)
3. Jane Goldman at the University of Connecticut 1986
 - o Giving sugar equal to one coke; decline in mental performance by 30 minutes and highly significant at 1 hour (2x as many mistakes)
 - o Harmful effect subsided at 1.5 hours

4. Judith Wurtman found a strong correlation between sugar intake, behavior and brain serotonin levels
5. Can create killer mice by lowering brain serotonin
6. Dr Ralph Bolton studied the Quolla Indians in Andes of Peru, known to be very aggressive. Found that:
 - o 55% of male population were hypoglycemic
 - o Main diet was mostly potatoes (a very powerful hypoglycemic)
 - o Docile males had a normal blood sugar
7. Egger and Carter (1985) studied 76 hyperactive children who were placed on a low carbohydrate diet, which also eliminated food dyes
 - o 82% of the children improved on diet and 28% returned to normal
 - o Highest reaction:
 - Yellow dye #5 (tartrazine)
 - Sodium benzoate
 - o Most common reactive foods:
 - Soybeans 73%
 - Cow's milk 64%
 - Chocolate 59%
8. College Male study Benton 1982
 - o Screened for psychiatric history, drug use and medical conditions
 - o Given questionnaire on aggressive behavior, hostility, anger and aggressive acts
 - o Strong relationship between aggressive answers and hypoglycemia

Nutrients and Behavior: Amino Acids

1. Tryptophan (precursor to neurotransmitter serotonin)
 - o Low tryptophan intake leads to depression, aggressive behavior and suicide
 - o Corn is very low in tryptophan (corn flakes, cornstarch, corn flour etc...)

- o Tyrosine (precursor to epinephrine, norepinephrine (attention) and dopamine (motivation))
 - Low levels associated with depression and sensitivity to stress

Nutrients and Behavior: Vitamins

1. Niacin (vitamin B3)
 - o Forms nicotinamide adenine dinucleotide (NAD)
 - o Pellegra-psychiatric symptoms common; 4 D's: diarrhea, dermatitis, dementia and death
 - o Subclinical deficiency described in 1938 – very common
 - o Niacin-responsive schizophrenia [Counter-indication]
2. Vitamin C,D,E,K,A,B and carotenoids
 - o All associated with behavioral manifestations when deficient, either in combination or alone
3. B1 deficiency: Beri-Beri
 - o Insomnia, depression, memory failure, chronic fatigue and personality change
4. National Nutritional Survey of Adolescents
 - o 60% deficient in iron
 - o 57% in vitamin A
 - o 43% in vitamin C
 - o 39% in B1
 - o 30% in protein
 - o 16% in riboflavin

Research in Children

Study of 1.1 million NY Public school children found a daily multivitamin significantly increased CAT scores when sugar was also removed from diet

In the first three bars no dietary changes were implemented. In the first yellow bar, sugar was removed and some of the food dyes. The next bar, some more food dyes were removed. The next year no dietary changes were effected and the last year even more food additives were removed. The CAT scores improved dramatically with the removal of sugar and food additives.

Research in Adults

1. Tucker et al 1990, found that deficiencies in thiamin and riboflavin impaired neuropsychological performance and altered EEG patterns in a significant number of adults
2. Study of 260 adults age 60+ found association with status of vitamin C, riboflavin, B12, folic acid and concept learning
3. Carotene showed a stronger correlation than vitamin A

Brain Allergies

1. Food allergies associated with neurological effects
2. Immune factors interact with the brain
3. Food-triggered immune reactions: Lethargy, stupor, disorientation, paranoia, delusions, hallucinations, agitation, rage, panic attacks, criminal behavior and even seizures
4. Schizophrenia:
 - o 88% allergic to wheat
 - o 60% to milk
 - o 50% to corn
 - o 100% to gliadin or gluten
 - o put on a gluten free diet almost all schizophreniacs returned to normal
5. Food allergies often result in craving for the food causing the allergy
6. Food allergies and hypoglycemia are linked (adrenal effect) [5]
7. Leading foods for allergy
 - o Milk (juvenile offenders drank more milk)
 - o Wheat
 - o Corn
 - o Coffee
 - o Eggs
 - o Potato
 - o Peanuts
 - o Soy

Research Showing a Connection Between Nutritional Status and Brain Function

1. Animals fed lard (animal fat) had impaired spatial learning, temporal memory
 2. Newer studies found impaired ability to learn and remember with saturated animal fats
 3. Omega-3 fats improved depression, memory retention and thinking (brain uses much omega-3 fats for its membrane)
 4. Animal fat absorb pesticides, industrial chemicals and herbicides
 5. DHA and arachidonic acid (omega 3 fats) in baby formulas to improve infant brain quality
 6. Low level of DHA in neurons correlated with violent behavior
 7. MSG injected into hypothalamus or amygdala could produce rage
 8. Lead is known to significantly increase violent behavior, suicide and juvenile delinquency
- “N-3” and “N-6” stand for Omega-6 fatty acids (bad) and Omega-3 fatty acids (good), respectively.

References and Further Reading:

1. Symposium Introduction: Nutrition and Gene Regulation
2. Gene-nutrient interactions during fetal development
3. W. Wendel and W. Beebe, ‘Glycolytic activity in schizophrenia’, In *Orthomol Psychiatry, treatment of schizophrenia*, Eds. Hawkins D & Pauling L. (1973)
4. There seems to be some controversy on this topic. Read a scope of literature available on the Internet through Google, here.
5. Hypoglycemia

Recommended Supplemental Video:

Nutrition and Criminal Behavior

<http://www.orthomolecular.org/library/jom/1975/pdf/1975-v04n02-p149.pdf>

Polyamine Levels in Jail Inmates

C. Groesbeck, M.A.,¹

B. D'Asaro, M.N.S.,²

and C. Nigro ³

ESSENCE OF ARTICLE

“Both testings showed significantly low spermine values, indicative of hypoglycemia. We have other indications that a large percentage of inmates suffer from some degree of low blood sugar, most probably secondary to drug and alcohol addiction (D'Asaro, 1974). Relative hypoglycemia can precipitate antisocial or criminal behavior. Because treatment of hypoglycemia is mainly dietary, inmates should be counseled as to proper diet— avoidance of sugar, caffeine, alcohol, drugs, and long fasts.”

ARTICLE

Morris County Jail inmates were found to have abnormal levels of blood polyamines. Inmate average blood levels of spermidine were significantly lower than normal blood levels ($p < .007$). Inmates having the lowest blood spermidine levels had committed significantly more violent crimes than inmates having normal blood spermidine levels ($p < .05$). Inmate average blood levels of spermine were significantly lower than normal blood levels ($p < .05$). Low spermine is one of several indications of relative hypoglycemia noted in Morris County Jail inmates.

Inmates had a broad range in blood levels of histamine, approaching the histamine range found in schizophrenics. The relationship of spermine to diet is discussed, and the need for further research into the relationship of polyamines to behavior is emphasized.

1 Crane Groesbeck, Project Coordinator, Morris County Jail Rehabilitation. Program funded by New Jersey State Law Enforcement Planning Agency. M.A., Experimental Psychology, New School for Social Research, 1967.

2 Barbara S. D'Asaro, Jail Nutritionist, M.N.D., Nutritional Science, Graduate School of Nutrition, Cornell, 1953.

3 Carol Nigro, Administrative Assistant to Jail Rehabilitation Program, Morristown High School, 1965.

Address: Office of the Sheriff, Morris County Courthouse, Washington Street, Morristown, N.Y. 07960.

BACKGROUND

We became interested in the relationship between blood polyamine parameters and behavior among jail inmates as abnormal blood levels of polyamines have been found in schizophrenics (Pfeiffer et al., 1969) and many personality test scores of inmates resemble those of schizophrenics. Abnormal polyamine levels were found by Pfeiffer to vary with scores on certain psychological tests. Therefore, we originally decided to measure inmate polyamine levels to see if inmate blood levels resembled those found by Pfeiffer in schizophrenics and if similar relationships existed between polyamine levels and psychological profiles.

Also, according to Pfeiffer (1973a, 1973b), low levels of spermine, a polyamine, may indicate relative hypoglycemia (low blood sugar). Persons with hypoglycemia can exhibit behavior disturbances independently of schizophrenia.

We have noted indications of a high incidence of hypoglycemia among jail inmates (D'Asaro, 1974). Spermidine In a preliminary blood study we noted that inmate blood levels of the polyamine spermidine were extremely low (Groesbeck, D'Asaro, and Nigro, 1973). The lowest spermidine levels were most frequent in inmates charged with violent crimes. The lowest inmate spermidine levels appeared with high extroversion scores on the Eysenck Personality Inventory. The extroversion result was interesting in that schizophrenics, who tend to be introverted (Eysenck, 1968), tend to have high blood levels of spermidine (Pfeiffer, 1970).

Spermine

We also noted low blood levels of the polyamine spermine among jail inmates. According to Pfeiffer (1973a, 1973b), low spermine levels indicate hypoglycemia (low blood sugar).

Histamine

We noted that the distribution of another polyamine, histamine, appeared abnormal. The large standard deviation (representing a large spread of scores, from very low to very high) approached that found among schizophrenics (Pfeiffer, 1970). Inmates' blood histamine levels varied from 0 to 120 Ng/ml, S.D. ± 29 .

We also noticed some relationship in the direction found in schizophrenics by Pfeiffer (1973a) between histamine levels and control beliefs (Groesbeck and Nigro, 1973).

PURPOSE OF THE PRESENT STUDY

We repeated blood tests and psychological testing to check out unpredicted results of the first testing. On this second testing we predicted: (1) low spermidine; (2) low spermidine levels appearing with violent crimes and/or high extroversion; (3) low spermine levels; (4) histamine levels spanning a broad range and related to locus of control.

PROCEDURE

Blood was drawn from 30 inmate volunteers. Duplicate samples were delivered the same day to the Brain Bio Center, 1225 State Road, Princeton, NJ. Analyses used fluorescent methods after column chromatography (Pfeiffer and Iliev, 1969).

RESULTS

Spermidine

As predicted, the average blood spermidine level of inmates again was extremely low as compared to the normal average relationship to the personality trait extroversion, as had appeared on the first testing. However, as predicted and as noted previously, inmates having the lowest blood spermidine levels had committed more violent crimes than other inmates (see Table 2).

TABLE 2

Low spermidine Normal spermidine Inmates (N=7) Inmates (N=7) Total t of violent crimes: 25 ($p < .05$) 9

Average # of violent crimes: 3.57 1.29 S.D.: 2.51 .95

POLYAMINE LEVELS IN JAIL INMATES

The number of violent crimes committed by the seven inmates having the most extreme low blood spermidine levels (below .60) was compared to the number of violent crimes committed by the seven inmates having the highest spermidine levels (normal, .88 to 1.26).⁴ Low spermidine inmates had committed significantly more violent crimes ($p < .05$).

Spermine

Inmate spermine levels were significantly lower than normal levels, as predicted ($p < .05$, see Table 3).

Histamine

Inmate histamine levels continued to have the broad spread reported in schizophrenics (see Table 4). We did not find the relationship between histamine levels and control beliefs which we had noted on the previous test.

⁴ Violent crimes included: murder, rape, assault, atrocious assault, armed robbery.

DISCUSSION

Spermine

Both testings showed significantly low spermine values, indicative of hypoglycemia. We have other indications that a large percentage of inmates suffer from some degree of low blood sugar, most probably secondary to drug and alcohol addiction (D'Asaro, 1974). Relative hypoglycemia can precipitate antisocial or criminal behavior. Because treatment of hypoglycemia is mainly dietary, inmates should be counseled as to proper diet— avoidance of sugar, caffeine, alcohol, drugs, and long fasts.

There is a great need for a commercially available snack item, high in protein, very low in sugar, and packaged suitably for easy distribution in institutions as jails, prisons, and mental hospitals. Such a snack item would tide inmates over any long foodless period, as between dinner and breakfast.

Any industry interested in manufacturing such an item should consult with both nutritionists and prison wardens as to composition, packaging, etc., in order to meet dietary needs and administrative needs in terms of prison sanitation and security.

Spermidine and Histamine

The reason for abnormally low spermidine levels and abnormal histamine ranges in inmates should be investigated.

TABLE 3

Spermine Levels (male)

Mean S.D.

Morris County Jail inmates: (N = 30) 1.25mcg/ml \pm 0.45 (p<.05)

Normals:* 1.48mcg/ml \pm 0.34

*Polyamine levels of normal, schizophrenic, and hypoglycemic males from Brain Bio Center, Princeton, N.J.

TABLE 4

Histamine Levels (male)

Mean S.D.

Morris County Jail inmates: 60Ng/ml \pm 29

Normals:* approximately 51Ng/ml \pm 16

Schizophrenic males:" 59Ng/ml \pm 37

•Polyamine levels of normal, schizophrenic, and hypoglycemic males from Brain Bio Center, Princeton, N.J.

The relationship between low spermidine and violent crime presents at least the possibility of a causal relationship with the potential of altering antisocial behavior by manipulating the level of a normally occurring body chemical.

CONCLUSIONS

1) Morris County Jail inmates were found to have abnormal levels of blood polyamines.

a) Inmate average blood levels of spermidine were significantly lower than normal blood levels; inmates having the lowest blood spermidine levels have committed significantly more violent crimes than inmates having normal blood spermidine levels.

b) Inmate average blood levels of spermine were significantly lower than normal blood levels. Low spermine is one of several indications of relative hypoglycemia noted in the Morris County Jail inmates. In theory, dietary rehabilitation to correct hypoglycemia may also correct criminal behavior in some cases.

c) Inmates had a broad range in blood levels of histamine, approaching the histamine range found in schizophrenics.

2) More research is needed to investigate the role of polyamines, diet, and behavior.

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<http://www.springerlink.com/content/h67k3h6652320t18/>

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Revised: 11 February 1986

ESSENCE OF ARTICLE

"Following the sucrose drink the children showed a decrement in performance in the structured testing situation, and they demonstrated more inappropriate behavior during free play. These differences in behavior were most pronounced approximately 45 to 60 minutes after the drinks. Thus, the study provides objective evidence in young children of a rather subtle, yet significant, time-dependent behavior effect of sucrose ingestion."

ARTICLE

Abstract Despite speculation that sucrose consumption affects behavior, little empirical information is available. Accordingly, this study investigated the effect of sucrose consumption on the behavior of eight preschool children. Children were tested individually using a double-blind, crossover design. On separate mornings each child received 6 ounces of juice, sweetened on one morning with sucrose and on the other with an artificial sweetener. Children were observed for 90 minutes following the drinks, alternating between 15-minute sessions of work on structured tasks and 15-minute sessions of free play. Following the sucrose drink the children showed a decrement in performance in the structured testing situation, and they demonstrated more inappropriate behavior during free play. These differences in behavior were most pronounced approximately 45 to 60 minutes after the drinks. Thus, the study provides objective evidence in young children of a rather subtle, yet significant, time-dependent behavior effect of sucrose ingestion.

This research was funded in part by grants from the General Research Grants Committee, University Hospital, Boston University Medical Center, and from the University of Connecticut Research Foundation. The project was conducted at the Clinical Research Center, Massachusetts Institute of Technology (National Institute of Health/General Clinical Research Center Grant 5M01-RR00088-20). We would like to express our appreciation to the many staff members of the Clinical Research Center for their extensive cooperation in helping us to plan and carry out this study, and to the director and staff of Technology Children's Center for their assistance in helping us to reach interested families. We also would like to thank the parents and children who participated in the study. Portions of this paper were presented at the annual meeting of the American Psychological Association, Toronto, August 1984.

PMID: 3782627

J Abnorm Child Psychol 1986 Dec;14(4):565-77 Related Articles, Links

Behavioral effects of sucrose on preschool children.

Goldman JA, Lerman RH, Contois JH, Udall JN Jr.

ESSENCE OF ARTICLE IS WHOLE ARTICLE

Despite speculation that sucrose consumption affects behavior, little empirical information is available. Accordingly, this study investigated the effect of sucrose consumption on the behavior of eight preschool children. Children were tested individually using a double-blind, crossover design. On separate mornings each child received 6 ounces of juice, sweetened on one morning with sucrose and on the other with an

artificial sweetener. Children were observed for 90 minutes following the drinks, alternating between 15-minute sessions of work on structured tasks and 15-minute sessions of free play. Following the sucrose drink the children showed a decrement in performance in the structured testing situation, and they demonstrated more "inappropriate" behavior during free play. These differences in behavior were most pronounced approximately 45 to 60 minutes after the drinks. Thus, the study provides objective evidence in young children of a rather subtle, yet significant, time-dependent behavior effect of sucrose ingestion.

Publication Types:

Clinical Trial

Controlled Clinical Trial

PMID: 3782627 [PubMed - indexed for MEDLINE]

PMID: 9257090

Eur Child Adolesc Psychiatry 1997 Jun;6(2):88-95 Related Articles, Links

Does oligoantigenic diet influence hyperactive/conduct-disordered children--a controlled trial.

Schmidt MH, Mocks P, Lay B, Eisert HG, Fojkar R, Fritz-Sigmund D, Marcus A, Musaeus B.

Central Institute of Mental Health, Department of Child and Adolescent Psychiatry, Mannheim, Germany.

ESSENCE OF ARTICLE

“Although only effective in a minority of children, dietary treatment cannot be neglected as a possible access to treating hyperactive/disruptive children and merits further investigation.

ARTICLE

A crossover 'placebo'-controlled, double-blind design was used to examine the effectiveness of an oligoantigenic diet in 49 children with hyperactive/disruptive behavior disorder. Effects of diet were compared with those yielded by stimulant medication (methylphenidate). The study was conducted in an inpatient unit at the Department of Child and Adolescent Psychiatry, Central Institute of Mental Health, Mannheim. Change in behavior was measured in standardized situations by trained raters, including behavior assessment when testing with CPT and PAT, during a free play situation, and at school. Twelve children (24%) showed significant behavioral improvement in two behavior ratings during diet relative to control diet conditions. Methylphenidate used in 36 children yielded more responders (44%) than diet. The amount of positive changes in behavior in those who received both treatments was about the same. Although only effective in a minority of children, dietary treatment cannot be neglected as a possible access to treating hyperactive/disruptive children and merits further investigation.

Publication Types:

Clinical Trial

Randomized Controlled Trial

PMID: 9257090 [PubMed - indexed for MEDLINE]

PMID: 12055324 [PubMed - in process]

Obes Res 2002 Jun;10(6):478-88

Evidence that intermittent, excessive sugar intake causes endogenous opioid dependence.

Colantuoni C, Rada P, McCarthy J, Patten C, Avena NM, Chadeayne A, Hoebel BG.

Department of Psychology, Princeton University, Princeton, New Jersey. Department of Physiology, University of Los Andes, Merida, Venezuela.

ESSENCE OF ARTICLE

“DISCUSSION: Repeated, excessive intake of sugar created a state in which an opioid antagonist caused behavioral and neurochemical signs of opioid withdrawal. The indices of anxiety and DA/ACh imbalance were qualitatively similar to withdrawal from morphine or nicotine, suggesting that the rats had become sugar-dependent.”

ARTICLE

OBJECTIVE: The goal was to determine whether withdrawal from sugar can cause signs of opioid dependence. Because palatable food stimulates neural systems that are implicated in drug addiction, it was hypothesized that intermittent, excessive sugar intake might create dependency, as indicated by withdrawal signs.

RESEARCH METHODS AND PROCEDURES: Male rats were food-deprived for 12 hours daily, including 4 hours in the early dark, and then offered highly palatable 25% glucose in addition to chow for the next 12 hours. Withdrawal was induced by naloxone or food deprivation. Withdrawal signs were measured by observation, ultrasonic recordings, elevated plus maze tests, and in vivo microdialysis.

RESULTS: Naloxone (20 mg/kg intraperitoneally) caused somatic signs, such as teeth chattering, forepaw tremor, and head shakes. Food deprivation for 24 hours caused spontaneous withdrawal signs, such as teeth chattering. Naloxone (3 mg/kg subcutaneously) caused reduced time on the exposed arm of an elevated plus maze, where again significant teeth chattering was recorded. The plus maze anxiety effect was replicated with four control groups for comparison. Accumbens microdialysis revealed that naloxone (10 and 20 mg/kg intraperitoneally) decreased extracellular dopamine (DA), while dose-dependently increasing acetylcholine (ACh). The naloxone-induced DA/ACh imbalance was replicated with 10% sucrose and 3 mg/kg naloxone subcutaneously.

DISCUSSION: Repeated, excessive intake of sugar created a state in which an opioid antagonist caused behavioral and neurochemical signs of opioid withdrawal. The indices of anxiety and DA/ACh imbalance were qualitatively similar to withdrawal from morphine or nicotine, suggesting that the rats had become sugar-dependent.

<http://www.nytimes.com/2002/09/24/health/nutrition/24BROD.html>

Schools Teach 3 C's: Candy, Cookies and Chips

By JANE E. BRODY

ESSENCE OF ARTICLE

“But in more and more schools nationwide, children from kindergarten through high school are being taught that "nutrition" comes in boxes of fast foods, candy wrappers and soft-drink cans and bottles.”

“Vending machines are going into schools that did not previously have them and even into elementary schools. Also, as you might expect, as children drink more soft drinks, which offer no redeeming nutritional value (the Center for Science in the Public Interest calls them "liquid candy).”

ARTICLE

School is back in session, but do you know what your children are learning about a matter of lifelong importance? That matter is food and drink, the substances that sustain health and life.

But in more and more schools nationwide, children from kindergarten through high school are being taught that "nutrition" comes in boxes of fast foods, candy wrappers and soft-drink cans and bottles.

In many schools, fast-food companies have co-opted the lunch program, and children have ready access to soft-drink and snack machines. In the classroom, too, children in 12,000 schools are required to watch a 12-minute television program every day with two minutes of commercials from companies like McDonald's, Hershey, Pepsico, Coca-Cola, KFC, Frito-Lay, Domino's and 7Up. As Dr. Marion Nestle of New York University points out in her illuminating book "Food Politics: How the Food Industry Influences Nutrition and Health" (University of California Press, 2002, \$29.95), "Given their purchasing power, numbers, potential as future customers and captive status, it is no wonder that food companies view schoolchildren as an unparalleled marketing opportunity." To be sure, in exchange for advertising and the opportunity to sell their nutritionally wanting products in schools, corporations often contribute money and materials desperately needed by schools. These companies pay for sports uniforms, scoreboards, computers and other items, some of which carry the company logo. When children's books are protected by covers bearing, say, the Coca-Cola logo, they see an advertising message even while they do their schoolwork. "Many commercial activities produced no tangible benefits for the school, although the benefits to advertisers were quite evident," added Dr. Nestle, who heads N.Y.U.'s department of nutrition and food studies. For example, advertisers may offer children free samples and coupons for fast food and sponsor Channel One closed-circuit programs viewed daily by 8.3 million schoolchildren, who see 2 minutes of commercial messages along with 10 minutes of news and features. But not every school official is in favor of this noxious trend. Dr. Nestle quotes Jill Wynns of the San Francisco school board: "The law requires your future customers to come to a place 180 days a year where they must watch and listen to your advertising messages exclusively. Your competitors are not allowed access to the market. The most important public institution in the lives of children and families gives its implied endorsement

to your products. The police and schools enforce the requirement that the customers show up and stay for the show."Lessons Start Early

Beginning in preschool, children are exposed to thousands of messages from advertisers that can corrupt the food lessons their parents hope to teach them. For example, Dr. Nestle cites the public television program for toddlers called "Teletubbies," sponsored first by Burger King and then by McDonald's, which distributed toys representing the four Teletubby characters. Then there are Saturday mornings, when parents may hope to catch some extra sleep while their young children are bombarded by television advertising for what Dr. Nestle calls "foods and beverages of dubious nutritional value: presweetened breakfast cereals, candy, fast foods, sodas, cookies, chips."Not one commercial for fruits, vegetables, bread or fish was shown, according to a study published in *The Journal of the American Dietetic Association*. Many studies have shown that young children do not readily distinguish program content from commercials. And, to make it even more difficult, commercials these days look and sound more and more like the programs. To Dr. Nestle, "food marketing to children is big business aimed at uncritical minds."Even some of the books bought for toddlers carry a not-so-hidden commercial message. For example, I bought my grandsons, who was then a year old, a Cheerios counting book (Cheerios being a nutritious non sugar-coated cereal) but rejected the books featuring Kellogg's Fruit Loops and Oreo Cookies. As Dr. Nestle wrote, "The Oreo book requires children to count (and presumably eat) their way through 10 cookies before reaching `and now there are none.' "Once children are in school, the commercial lessons continue. More and more school lunch programs now offer brand-name fast foods. Some schools have turned their entire lunch programs over to management companies that bring in nothing but fast foods, in the process forfeiting the federal reimbursements offered to schools that meet government nutritional standards. Of course, the children are required to pay a lot more for these meals — \$2 or \$3 instead of 40 cents — which may make them out of reach for children from low-income families, the very children school lunch programs were designed to help. More Pop, Less Milk Some districts sign "pouring-rights contracts" and they result in soda-pop vending machines in thousands of schools in return for big bucks the schools say they desperately need. The companies may even offer bonuses to schools that exceed stated sales targets. For example, in 1997 the 53-school Colorado Springs district signed an \$8-million, 10-year agreement with Coca-Cola that included cash bonuses for extra sales and incentives like a new car for a senior with high grades and a perfect attendance record. As you might guess, the students comply. As reported in the *American Journal of Public Health*, "What we have seen in just about every exclusive contract around the country is a resulting increase in the amount of soda consumed by students."Vending machines are going into schools that did not previously have them and even into elementary schools. Also, as you might expect, as children drink more soft drinks, which offer no redeeming nutritional value (the Center for Science in the Public Interest calls them "liquid candy"), they consume less of the nutritious drinks like milk and fruit juices. Fruit drinks that contain 5 percent fruit juice to meet government standards still have too little of the natural product to be considered nutritious, Dr. Nestle said. Can this trend be curbed? "By the end of 2000, more than 30 school districts in California, Tennessee and Wisconsin, for example, had refused such deals after protests by parents, students and school officials," Dr. Nestle reported."Philadelphia refused an offer from Coca-Cola for \$43 million over a 10-year period," she said, "and Michigan turned down a contract that would have covered 110 school districts encompassing nearly half a million students."What is needed now is legislation at the national level, laws with enforcement teeth. So if you are a parent concerned about your child's health,

pay attention to the nutrition messages the children receive at school and at home and write to your representatives in Congress about the need for national action.

<http://www.nytimes.com/2002/09/24/health/nutrition/24BROD.html>

www.Lancet.com vol 357 #9255 2/17/01

prospective, observational analysis

Relation between consumption of sugar-sweetened drinks and childhood obesity:

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ESSENCE OF ARTICLE

“Background The rising prevalence of obesity in children has been linked in part to the consumption of sugar-sweetened drinks.”

“Excessive bodyweight probably now constitutes the most common paediatric medical problem in USA. Although the cause of this apparent obesity epidemic is likely to be multifactorial, our findings suggest that sugar-sweetened drink consumption could be an important contributory factor.”

ARTICLE

Background The rising prevalence of obesity in children has been linked in part to the consumption of sugar-sweetened drinks. Our aim was to examine this relation.

Methods We enrolled 548 ethnically diverse schoolchildren (age 11•7 years, SD 0•8) from public schools in four Massachusetts communities, and studied them prospectively for 19 months from October, 1995, to May, 1997. We examined the association between baseline and change in consumption of sugar-sweetened drinks (the independent variables), and difference in measures of obesity, with linear and logistic regression analyses adjusted for potentially confounding variables and clustering of results within schools.

Findings For each additional serving of sugar-sweetened drink consumed, both body mass index (BMI) (mean 0•24 kg/m²; 95% CI 0•10-0•39; p=0•03) and frequency of obesity (odds ratio 1•60; 95% CI 1•14-2•24; p=0•02) increased after adjustment for anthropometric, demographic, dietary, and lifestyle variables. Baseline consumption of sugar-sweetened drinks was also independently associated with change in BMI (mean 0•18 kg/m² for each daily serving; 95% CI 0•09-0•27; p=0•02).

Interpretation Consumption of sugar-sweetened drinks is associated with obesity in children.

Prevalence of Impaired Glucose Tolerance among Children and Adolescents with Marked Obesity

Ranjana Sinha, M.D., Gene Fisch, Ph.D., Barbara Teague, R.N., William V. Tamborlane, M.D., Bruna Banyas, R.N., Karin Allen, R.N., Mary Savoye, R.D., Vera Rieger, M.D., Sara Taksali, M.P.H., Gina Barbetta, R.D., Robert S. Sherwin, M.D., and Sonia Caprio, M.D.

ESSENCE OF ARTICLE

“Background Childhood obesity, epidemic in the United States, has been accompanied by an increase in the prevalence of type 2 diabetes among children and adolescents.”

“Conclusions Impaired glucose tolerance is highly prevalent among children and adolescents with severe obesity, irrespective of ethnic group. Impaired oral glucose tolerance was associated with insulin resistance while beta-cell function was still relatively preserved. Overt type 2 diabetes was linked to beta-cell failure.”

ABSTRACT

Background Childhood obesity, epidemic in the United States, has been accompanied by an increase in the prevalence of type 2 diabetes among children and adolescents. We determined the prevalence of impaired glucose tolerance in a multiethnic cohort of 167 obese children and adolescents.

Methods All subjects underwent a two-hour oral glucose-tolerance test (1.75 mg of glucose per kilogram of body weight), and glucose, insulin, and C-peptide levels were measured. Fasting levels of proinsulin were obtained, and the ratio of proinsulin to insulin was calculated. Insulin resistance was estimated by homeostatic model assessment, and beta-cell function was estimated by calculating the ratio between the changes in the insulin level and the glucose level during the first 30 minutes after the ingestion of glucose.

Results Impaired glucose tolerance was detected in 25 percent of the 55 obese children (4 to 10 years of age) and 21 percent of the 112 obese adolescents (11 to 18 years of age); silent type 2 diabetes was identified in 4 percent of the obese adolescents. Insulin and C-peptide levels were markedly elevated after the glucose-tolerance test in subjects with impaired glucose tolerance but not in adolescents with diabetes, who had a reduced ratio of the 30-minute change in the insulin level to the 30-minute change in the glucose level. After the body-mass index had been controlled for, insulin resistance was greater in the affected cohort and was the best predictor of impaired glucose tolerance.

Conclusions Impaired glucose tolerance is highly prevalent among children and adolescents with severe obesity, irrespective of ethnic group. Impaired oral glucose tolerance was associated with insulin

resistance while beta-cell function was still relatively preserved. Overt type 2 diabetes was linked to beta-cell failure.

Source Information

From the Departments of Pediatrics (R.S., W.V.T., V.R., S.T., G.B., S.C.) and Internal Medicine (R.S.S.), the Children's General Clinical Research Center (G.F., B.T., B.B., K.A., M.S.), and the Division of Biostatistics, Department of Epidemiology and Public Health (G.F.), Yale University School of Medicine, New Haven, Conn.

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This article has been cited by other articles:

Rocchini, A. P. (2002). Childhood Obesity and a Diabetes Epidemic. *N Engl J Med* 346: 854-855 [Full Text]

<http://news.bbc.co.uk/2/hi/health/8281147.stm>

Daily sweets 'linked to violence'

Children who cannot wait for something they want may become aggressive

Could childhood sweet eating make you violent?

Children who eat sweets and chocolate every day are more likely to be violent as adults, according to UK researchers.

The Cardiff University study involving 17,500 people is the first into effects of childhood diet on adult violence.

It found 10-year-olds who ate sweets daily were significantly more likely to have a violence conviction by age 34.

Researchers suggested they had not learnt to delay gratification, but other experts said already "difficult" children might be given more sweets.

The researchers looked at data on around 17,500 people and found that 69% of the participants who were violent at the age of 34 had eaten sweets and chocolate nearly every day during childhood, compared to 42% who were non-violent.

Delinquents

This link between confectionery consumption and later aggression remained even after controlling for other factors such as parenting behaviour, the area where the child lived, not having educational qualifications after the age of 16 and whether they had access to a car when they were 34.

Targeting resources at improving children's diet may improve health and reduce aggression

Dr Simon Moore, Cardiff University

The researchers put forward several explanations for the link including the idea that the confectionery makes the adult addicted to certain additives and that these may contribute towards adult aggression.

The study was reported in the British Journal of Psychiatry.

Stunted learning

Dr Simon Moore, who led the study, has carried out previous research on young offenders.

He was aware that they tend to have very poor diets including lots of confectionery - but was intrigued to find the link.

This is either utter nonsense or a very bad April Fool's Day joke

Julian Hunt

Food and Drink Federation

He said: "Our favored explanation is that giving children sweets and chocolate regularly may stop them learning how to wait to obtain something they want.

"Not being able to defer gratification may push them towards more impulsive behavior, which is strongly associated with delinquency.

"Targeting resources at improving children's diet may improve health and reduce aggression."

Professor Alan Maryon-Davis, president of the UK Faculty of Public Health, said: "Another explanation is that children who are already more demanding, aggressive and 'difficult' are more likely to be given sweets and chocolates to keep them quiet for a while.

"It is an interesting area that needs looking into a little more deeply."

Julian Hunt, Food and Drink Federation (FDF) director of communications, said: "This is either utter nonsense or a very bad April Fool's Day joke.

"Anti-social behavior stems from deep-rooted social and environmental factors, such as poor parenting and a deprived upbringing, and is not linked to whether or not you ate sweets as a kid.

"How anyone could leap to such a conclusion is beyond me."

But Dr Simon Moore said: "We are fairly confident that this is a realistic relationship - the key is explaining what the mechanism is behind this relationship.

"We think that rewarding bad behavior in childhood with confectionery can lead to later problems but we need to look at this more closely."