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A Hazard of "Diet Pop"

Charles Wolf

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NOTES AND COMMENTS: I

A Hazard of "Diet Pop"

Charles Wolf, M.D.*

Calorie-free carbonated beverages, or "diet pops," are becoming increasingly popular and many households no longer contain the older, more familiar, sugar containing, carbonated beverages. Because physicians frequently make use of "soda pop" when prescribing treatment for common pediatric conditions such as febrile episodes or bouts of vomiting or diarrhea, the following case report is presented to illustrate the fact that physicians must ascertain that the beverage to be used to maintain hydration is not calorie free.

Report of a Case

In late January of 1968, a 6-year-old white boy (T.F., HFH #121 80 58) began showing signs and symptoms of mild allergic bronchitis which he had periodically experienced in the past. For five days he was given decongestants and bronchodilators in proper doses for his age, and his condition improved. He remained in school during this time and he ate well. Following a swimming lesson on Saturday morning, he began experiencing fever ranging to 104 F (40 C) and he began vomiting. At that point a Henry Ford Hospital physician was consulted by telephone. He suggested that the patient's hydration be maintained with clear liquids, relying heavily on "soda pop." The child continued to vomit but consumed three bottles of a popular "soda pop" that day. Judged by the amount of urine produced hydration was adequate. The following day he vomited but also retained a quantity of a different "diet cola." Monday morning — 36 hours after the onset of vomiting — he appeared so seriously ill that the mother rushed him to the physician. This child was usually robust and healthy except for his allergic problems. The family history revealed that others had allergic problems but none had diabetes mellitus.

On physical examination his temperature was 101.4 F (38.6 C) weight 23 kg. (48 pounds) and height 117.5 cm (47 inches). The child appeared acutely and seriously ill with dramatic Kussmaul respirations at 30 per minute. His skin was flushed and hot but the turgor was excellent. There was a strong odor of acetone on his breath

*Department of Pediatrics

Wolf

and in the examining room. Buccal mucosa was dry and medium rales were heard throughout his chest. Initial impressions were pneumonia with diabetes mellitus and ketoacidosis.

A urinalysis was done immediately and the test for acetone was strongly positive, but there was no glycosuria. He urinated on request. Specific gravity was 1.020, adding evidence that he was not severely dehydrated. Since the child did not have diabetes mellitus the parents were questioned further. This revealed that all the "soda pop" that the child had consumed had been popular brands of dietary, sugar free, carbonated beverages. Indeed, the household was stocked with no other kind. The mother assumed these were satisfactory since the physician had prescribed "soda pop" without making a distinction between dietetic beverages and the ordinary carbonated waters which contain sugar.

The boy was hospitalized. Laboratory studies revealed a hemoglobin of 15.1 grams and a white count of 12,000 cells per cubic millimeter with 31 bands, 54 segmented neutrophils, 11 lymphocytes and 4 monocytes. Granulocytes revealed toxic changes. Chest x-ray revealed "bilateral peribronchial infiltration compatible with bronchopneumonia," but pneumonia was not considered extensive. Throat and nose cultures revealed *Diplococcus pneumoniae*. Serum electrolyte studies were: sodium 133mEq/liter, potassium 5.4 mEq/liter, chloride 106 mEq/liter and CO_2 9.5 mEq/liter. Unfortunately a pH determination was not done at that time.

Management of this patient consisted of antibiotic therapy for the pneumonia and parenteral fluid therapy appropriate for acidosis. The acidotic state quickly disappeared and electrolyte studies were normal the following morning when the pH was 7.42. The child was clinically much improved and his course was thereafter uneventful. There was no weight gain during hospitalization, again indicating dehydration was not a feature of the illness.

Discussion

As a result of this experience many families were subsequently questioned in the clinic regarding the kind of "soda pop" used in their homes. It then became evident that many mothers were serving only the dietary, sugar-free beverages. In the case herein reported it appears that acidosis was due to starvation since the patient had received no calories. However, hydration had been fairly well maintained by the use of the beverages. The child did not appear very dehydrated and urinated promptly upon request when he was very acidotic. The specific gravity of the initial urine sample was 1.020. Since there was no weight gain after parenteral fluid therapy and clinical improvement, it was concluded that enough of the beverages had been retained to prevent dehydration. But, deprivation of calories had permitted a state of starvation acidosis to occur. Had the older, sugar containing "soda pops" been offered, it was thought the clinical problem of severe ketoacidosis due to febrile illness would not have resulted.

A Hazard of "Diet Pop"

Since "soda pop" is frequently and justifiably prescribed and since it is now obvious that many homes serve only the dietary, sugar free beverages, it is considered important for the physician to stress to the parents that the calorie free beverage must not be used in maintaining hydration in the usual pediatric disorders for which soda waters are prescribed.

Addendum

Recently the Federal Food and Drug Administration has reviewed the problem of cyclamate toxicity in man. The studies are incomplete as yet, but there is some suggestion that cyclamate may lead to chromosomal damage. Although cyclamate was the sweetening agent in the soft drinks our patient ingested, the toxic effect herein reported seems to be due more to the absence of free sugar and calories, although direct cyclamate toxicity, of course, cannot be completely ruled out.

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