UNIVERSITY OF NEVADA RENO
Internal Medicine
Research Laboratory
Anderson Medical Building/MS 352
Reno, Nevada 89557-0046

The Case of the Barfing Boy!

Randy Milburn

Lassen College
Math & Science Camp for Young Women
June 26, 1997

Facilitators:
Dr. Gale Hansen Starich
Dr. Jamie Campbell

1.

Randy Milburn is a 10-year-old male who is brought by his mother to your office complaining or weakness, thirst, and prolonged bouts of vomiting.

2.

Randy is a pale, perspiring, 10-year-old boy displaying agitation and slight delirium. He is unable to walk without assistance and periodically wretches uncontrollably. His mother gives the history.

Randy was well until the past two months. In that period of time, he has lost about ten pounds, although his appetite seemed unchanged. He has, in recent weeks, been going to the bathroom to urinate more often, and has been very thirsty and drinking a lot. For the past two days he has looked pale and has had no appetite. Yesterday morning, he woke up with nausea and vomiting, which became more severe as the day progressed. This morning, he complained of a left ear ache and from time to time, complained of a pain in his belly. The vomiting continued, and he became agitated. About an hour before Mrs. Milburn called your office, he began having some trouble breathing, (shortness of breath). He became progressively weaker, and could not walk without help from Mr. and Mrs. Milburn. Mrs. Milbum became frightened because Rand looked so sick, so she called your office and the receptionist told her to bring him in today. She is very relieved that you could see Randy today .

Randy reports that he has never felt so sick, and that he couldn't stop vomiting. He could not keep anything in his stomach. even though he was very thirsty and kept trying to drink a little water or ginger ale. Mrs. Milburn adds that Rand acted strange today, almost out of his head at times. She says that Rand could not even walk to the bathroom without help. "I have never seen him like this, and I am really worried about him." She adds that "He has never behaved like this before. The pain in his belly just comes and goes, and he just lies on the couch and cries from time to time." He hasn't had a BM for two days. Mrs. Milburn doesn't think Rand has a fever, although he has "felt warm at times".

Nothing that Mrs. Milburn has tried has helped him at all. She gave him some ginger ale and ice, but he threw that up too. She also gave him some Pepto-Bismol, but that didn't help either.

Randy has been a pretty healthy child until two months ago. He did get a lot of colds, but otherwise, except for tonsillitis or ear aches, he was OK. He had his tonsils out when he was six years old, and was circumcised shortly after birth. Otherwise, he has

never been in the hospital. He never takes medication except for antibiotics when he gets an earache or a sore throat. His immunizations are all up to date. He is allergic to penicillin.

Normally, Rand is a real good eater. Mrs. Milburn reports that she "never have any problems with him trying new foods". She tries to "keep our diet low in fat, and we eat lots of fruits, vegetables, and pastas." Randy is not a very active kid, and although his parents encourage him to go out and play, he prefers to stay inside and read. Last year, he tried to sniff glue, but it made him sick, and he "gave up that crazy idea, and he's never experimented with smoking, alcohol or drugs.

Randy is the oldest of three children. The other two are fine. He was a big baby when he was born; weighing 8 lbs., 8 oz. Mr. and Mrs. Milburn are both in good health. The family all "gets along well". He doesn't go out and play sports with the other kids, preferring to stay home and read or watch television. The two younger children are girls, three and six years old. Mrs. Milburn has had all three children checked regularly. She knows of no diseases that "run in the family", no hypertension, heart disease, diabetes, cancer, or other chronic diseases.

3.

Physical Exam Results:

Temperature = 98.2 ° F, rectal
Blood pressure = 72/50 mmHg
Pulse = 164/min
Respiration = 32/min
Height = 60"
Weight = 85 lbs.

General:

The patient is a 10-year-old boy in acute distress. He has moderate pallor and exhibits deep, rapid breathing. He has a sunken appearance to the eyes. He cries out from time to time, and does not respond to questions.

HEENT:

The lips, tongue and mucous membranes appear quite dry. Pupils are equal, round and

reactive to light, bilaterally. The sclerae are clear. The left auditory canal is occluded by a purulent otorrhea. After cleaning, the left tympanic membrane is distorted with some injection, and old scarring is present. The right auditory canal is clear; the tympanic membrane is clear without injection or fluid. The throat
shows a few scattered pustular lesions with some hyperemia. There is marked gingival inflammation with white peridental debris. A fruity odor is noted on his breath.

Chest:
There are deep, rapid respiratory excursions with retraction of intercostal muscles and use of abdominai muscles noted. No rales, wheezes or rhonchi are present.

Heart:
Heart rate is rapid. Rhythm appears normal, without murmurs.

Abdomen:
Firm to palpation, but with no pain, guarding, or rebound elicited. The child occasionally cries out during palpation, but this is not constant. No hernias are present. Rectal examination is negative for masses or frank bleeding. Stool is soft and brown. hemoccult is negative.

Extremities:
The extremities are dusky and cool to the touch.

Neurologic:
The patient is semi-alert. He knows he is at your office, but does not answer questions without constant prodding. He responds to painful stimuli. He is somewhat irritable and cries out periodically for no evident reason. Deep tendon reflexes are 2+/4. All other findings are within normal limits.

4.

CBC with Differential:
WBC = 2,840/mm3 (4,600-10,200)
RBC = 5.95 million/mm3 (4.50-5.40)
Hemoglobin = 16.3 gm/dl (12.5 - 15)

Hematocrit = 52.3 (31 - 43)

5.

URINALYSIS:
Protein = 4+ (negative)
Glucose = 3+ (negative)
Ketones = 3+ (negative)

6.

ELECTROLYTES:
Na^+ = 154 mEq/l (135 - 148)
K^+ = 5.2 mEq/l (3.5 - 5.0)
Cl^- = 1OO mEq/l (98 - 105)
HCO_3- = 8.4 mEq/l (18 - 25)
BUN = 30 mg/dl (10 - 20)
Creatinine = 1.2 mg/dl (0.3 - 0.9)
Glucose = 564.5 mg/dl (70 - 105)

7.

ARTERIAL BLOOD GASES:
Room Air Hgb = 15.0 gm% Temp. = 37 ° C
pH = 7.18 (7.36 - 7.45)
$PaCO_2$ = 23.3 mmHg (36 - 38)
PaO_2 = 41.6 mmHg (65 - 76)
HCO_3- = 8.4 mEq/l (18 - 25)
B.E. = -17.7 mEq/l (-2.0 - +2.0)
O_2 Saturation = 65.3 % (> 95)

8.

OTHER TESTS:
Serum acetone = Positive- 1:16 (Negative)
Serum osmolarity = 432 mOsm/l (285 - 295)

9.

Randy was diagnosed as having diabetic ketoacidosis, with dehydration, left suppurative otitis media, and gingivitis.

He was given IV fluids, at first, of 0.9% normal saline. With the diagnosis made, the fluid was switched to 1000 cc 0.45% saline with 25 mEq NaHCO3, 20 mEq KCl, and 20 mEq potassium phosphate, to run at 170 cc/hr. He also received 10 units regular insulin subcutaneously and a slow infusion of 125 units of regular insulin in 250 cc 0.9 % saline with 3 cc 5% albumin to be run at 0.1 unit/kg/hr. He was also placed on erythromycin.

10.

REPEAT BLOOD GASES: 2 HOURS LATER:
pH = 7.24 (7.36 - 7.45)
$PaCO_2$ = 63.9 mmHg (36 - 38)
PaO_2 = 142 mmHg (65 - 76)
HCO_3^- = 27.5 mEq/l (18 - 25)
B.E. = -1.4 mEq/l (-2.0 - +2.0)
O_2 Saturation = 92 % (> 95)

11.

Serial re-evaluations and close monitoring were done and insulin modified at the patient improved.

Randy rapidly improved and was placed on insulin therapy and a 1500 calorie ADA diet, explained by the hospital dietician. Randy and his mother received diabetic teaching, including insulin injection, home accuchecks, and home glucometer use. The next few days were spent adjusting his insulin.

After five days of hospitalization, Rand was discharged. His discharge medication was 6 units of human insulin NPH each morning and 4 units of regular human insulin and 2 units of human insulin NPH each evening. He was seen in the office 5 days later, with no further adjustment of his insulin dose required at that time.

Randy and his mother are compliant patients and one year later, he continues to do well, and his glucose levels remain under control.