Look Out for Hyperglycemic Hyperosmolar State

BY TIMOTHY F. KIRN
Sacramento Bureau

CHICAGO — Physicians who see children must be on the lookout for hyperglycemic hyperosmolar state because the rising tide of pediatric obesity and type 2 diabetes means that this diagnosis is going to occur more often in children, Dr. Arlan L. Rosenbloom said at the annual scientific sessions of the American Diabetes Association.

"We may be headed for a disastrous situation with this problem," said Dr. Rosenbloom, professor emeritus in the division of pediatric endocrinology at the University of Florida, Gainesville.

Dr. Rosenbloom said that he first described a case of hyperglycemic hyperosmolar state (HHS) in a pediatric patient at a meeting in 2002. The response that report generated led him to find information about six more cases, which he published.

Now, just 5 years after his first presentation, 44 cases have been described in the literature.

It is not clear how commonly hyperglycemic hyperosmolar state occurs in obese children, but Dr. Rosenbloom has tried to make an estimate.

A group at Children's Hospital Philadelphia reported in 2005 that of 190 patients diagnosed with type 2 diabetes over a 5-year period, 7 patients had an episode of HHS, or almost 4%.

Extrapolation from the incidence rate of new type 2 diabetes cases in children and adolescents suggests at least 100 pediatric cases of HHS in the United States a year, he said.

Unlike in adults, most pediatric cases of HHS occur in individuals who have not been diagnosed with type 2 diabetes at the time they present, Dr. Rosenbloom said.

None of the 44 reported cases, 35 of which met the strictest criteria for HHS, had diagnosed diabetes at the time they came to medical attention. In adults, 60%-70% of cases occur in persons with known diabetes.

The risk factors for HHS in pediatric patients include obesity (37 of the 44 reported cases), African American race (35 of 44), male gender (35 of 44), acanthosis nigricans (31 of the 37 obese individuals), a family history of type 2 diabetes (all cases), and retardation, severe autism, or cerebral palsy (7 of 44).

The rising tide of obesity and type 2 diabetes in children means HHS is going to be seen more often. 'We may be headed for a disastrous situation.'

The symptoms that precede HHS include nausea and vomiting, abdominal pain, polyuria/polydipsia, malaise and weakness, weight loss, confusion, and headache and dizziness.

"I can't put numbers on this because the details in the reported cases vary widely," he said.

Death occurred in 21 of the 44 patients. Mortality does not appear to be related to the severity of renal failure or the osmolality at presentation, as it is in adults. The ranges of serum creatinine and serum osmolality in the reported cases do not differ between those who died and the survivors, Dr. Rosenbloom said.

Mortality seems to be the result of organ damage caused by hypoperfusion, and therefore, patients require rapid and intense reperfusion.

Management, which should take place in the intensive care unit, requires rapid resuscitation for shock with 0.9% saline, followed by 0.45% saline at twice the maintenance level, and insulin should be held until after initial hydration. Bicarbonate should not be given.

Treating physicians must consider that the patient may have pancreatitis, rhabdomyolysis, and deep venous thrombosis.

"Prevention requires that primary care, emergency physicians have a high index of suspicion for type 2 diabetes in sick, obese youngsters, especially in African Americans, or others with a family history [of type 2 diabetes], and appreciate the difficulty in assessing hyperosmolar dehydration in the obese youngster," he said. "Both obesity and hyperosmolality mask some of the typical signs that pediatricians are used to.

"Perform basic biochemical studies, I should say, at the drop of a hat," Dr. Rosenbloom advised. ■