Cyclic Vomiting Syndrome, Metabolic Dysfunction Linked?

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WASHINGTON – About a third of children with cyclic vomiting syndrome appear to have some metabolic condition, either mitochondrial dysfunction, fatty acid oxidation dysfunction, or a combination of both.

Unfortunately, there seems to be neither rhyme nor reason to the pattern. “Some showed the abnormalities only when well, some showed them only when acutely ill, and some showed them all the time,” Dr. David Rothner said at the meeting.

Dr. Rothner, director of the Pediatric/Adolescent Headache Program at the Cleveland Clinic, and his colleagues presented the largest-to-date case series of metabolic testing in children with cyclic vomiting syndrome. Considered one of the three subtypes of migraine, cyclic vomiting is a debilitating illness with no known etiology and virtually no physical abnormalities that account for its occurrence.

The condition is a chronic disorder characterized by repeated, stereotypical vomiting episodes accompanied by abdominal pain and nausea. There is more vomiting with this syndrome than in any other disease known to man.”

Diagnosis can be made only by ruling out every possible physical cause. “Often, the time from the first episode until diagnosis can be 3 or 4 years, which is tragic,” he said.

The prospective cohort consisted of 106 consecutive patients seen at the clinic from 2007 to 2010. Most were 8 or 9 years old, male (57%), and white (77%), and “most importantly, 26% had a personal history of migraine, which did not occur during the vomiting.”

Most of the children (71%) also had a family history of migraine; 10% had a family history of epilepsy. The episodes occurred an average every 4 weeks. The mean duration of the acute phase was 25 hours, with a mean of 18 vomits during that time, up to 5 per hour.

“There was complete resolution of symptoms between the spells in 88% of these children,” Dr. Rothner said. Most children (73%) had a prodromal phase, usually abdominal pain and nausea. There were some identifiable triggers for 66%, including viral illness, and motion sickness. Along with vomiting, 25% of the children had some autonomic symptom, including fever and hypertension.

Of the 42 patients who underwent magnetic resonance imaging, magnetic resonance results “of them already had the abnormalities recognized before the disorder began, but none of them had anything to do with the vomiting,” Dr. Rothner said. He and his team also performed abdominal ultrasound on 41 children during the acute phase to rule out intestinal malrotation or volvulus. There were no gastrointestinal abnormalities related to vomiting.

The investigators aimed to perform metabolic testing of blood and urine during both the well and ill phase in all children. At least some testing was accomplished in 58. One-third of the children tested during the ill or well phase, or during both, showed some sign of mitochondrial dysfunction or abnormal oxidation of fatty acid. But the results were very difficult to interpret, Dr. Rothner said. “Of the 16 patients who had testing at both phases, 13 had abnormalities. But three showed mitochondrial dysfunction when well and not when ill, four had abnormalities when ill but not when well, and another three had some combination of mitochondrial and fatty acid dysfunction during both times. When we looked at the metabolic testing based on timing, we expected to find more abnormalities at the time of acute illness, but this was not the case. The results were not consistent.”

There is no universally accepted treatment for the disorder. “There is not one,” Dr. Rothner said. For prophylactic treatment, about half of the group experienced some benefit from amitriptyline. During the acute phase, 85 children tried high-dose oral ondansetron, which improved or resolved symptoms in 66%. Now, on the metabolic testing, some of the children in the group also receive carmine and co-enzyme Q10, which Dr. Rothner said confers at least some benefit to about half the group.

The children are part of a continuous study which Dr. Rothner hopes will shed more light on the disorder’s connection with metabolic dysfunction.