Silent Strokes Common in Acute Anemic Events

BY SHERRY BOSCHERT

FROM THE INTERNATIONAL STROKE CONFERENCE

LOS ANGELES – Acute anemic events were associated with significantly increased risk for "silent" strokes not only in children with sickle cell disease but also in children with acute anemia due to other causes, a controlled study of 52 patients found.

Prospective screening of all children who were admitted to one hospital during a 30-month period found that 398 were having acute anemic events – accounting for nearly 1% of all admissions and 12% of children admitted with sickle cell disease.

VITALS

Major Finding: Diffusion-weighted MRI in children hospitalized with acute anemic events showed evidence of acute silent infarction in 4 of 22 patients with sickle cell disease (18%) and in 2 of 30 patients without sickle cell disease (7%).

Data Source: Prospective, controlled study of 52 children.

Disclosures: Dr. Dowling said he had no relevant conflicts of interest. He has received research support from First American Real Estate Services Inc. The Children's Medical Center, Dallas, funded the study.

Diffusion-weighted MRI in 52 of these children showed evidence of acute silent infarction in 4 (18%) of 22 patients with sickle cell disease and in 2 (7%) of 30 patients without sickle cell disease, Dr. Michael M. Dowling and his associates reported at the conference.

"I didn't initially plan a controlled study," but funders insisted, and the comparison yielded unexpected information, said Dr. Dowling, a pediatric neurologist at the University of Texas Southwestern Medical Center, Dallas.

"I didn't think these children [without sickle cell disease] would be having silent infarctions."

In addition, three patients with sickle cell disease showed evidence of what looked like remote silent infarctions on MRI (14%). Dr. Dowling said he was "fascinated" to also find evidence of remote silent infarctions in seven of the control patients (23%).

Acute anemic events accounted for nearly 1% of all admissions and 12% of children admitted with sickle cell.

DR. DOWLING

"These are not children with sickle cell disease. I'm worried that a lot of these children with acute anemic events were prone to recurrent anemic events from dysfunctional uterine bleeding, cancer, or repeat GI bleeds. I'm worried that at previous admissions they may have had an acute silent infarction in the setting of an acute anemic event that was missed," Dr. Dowling said at the conference, which was sponsored by the American Heart Association.

Overall, 31% of all MRIs were abnormal, including acute and remote silent infarctions.

"I think we can't simply look at a severely anemic child in an emergency room and say he's hemodynamically stable, because I think these kids are losing brain cells. We need to respond to them more quickly," he said.

He hopes that a future study will monitor these kinds of children at home via a pulse oximeter so that when their hemoglobin level falls, they can be brought in sooner for transfusion. "I think we can prevent injury," he said.

Previous studies suggest that approximately 10% of children with sickle cell disease will have a clinically evident stroke unless they get prophylactic therapy, and up to 35% will have silent infarctions.

"It's a bad term because they're not silent," Dr. Dowling said. "They cause significant cognitive impairment," educational delays, and increased risk for new or progressive silent infarctions and overt stroke.

His working definition of silent infarction is an MRI lesion consistent with infarction without a focal deficit lasting more than 24 hours. The study defined an acute anemic event as either a hemoglobin level no higher than 5.5 g/dL or, for children with sickle cell anemia whose "normal" hemoglobin level may be 6 g/dL, a decline of at least 30% from baseline hemoglobin level.

Follow-up imaging in four patients with acute silent infarctions showed signals consistent with permanent brain injury in three of them, but not in the fourth. "Some of these might be reversible," Dr. Dowling said.

He estimated that the incidence of acute silent infarction during acute anemic events is 633 per 100 patient-years in children with sickle cell disease, and 243 per 100 patient-years in children without sickle cell disease, based on the study's findings. His estimates are much larger than are those from the SIT (Silent Infarct Transfusion) study, which suggested an incidence of 43 per 100 patient-years in children with sickle cell disease as a whole, he said.

"We have identified unsuspected silent infarctions occurring during acute anemic events in 18% of children with sickle cell disease and 7% of controls. I think these events may be telling us" that children with acute anemia may need closer observation, he said.

The etiologies of acute anemia were a bit surprising in both the sickle cell and control groups. There were more oncology patients than anticipated among the 294 children who were admitted without sickle cell disease. Aplastic or hemolytic anemias were the leading etiology. Others included gastrointestinal bleed or liver problems, leukemias, lymphomas, and other cancers. Among patients with sickle cell disease and acute anemia, fewer than expected had acute chest syndrome, aplastic crisis, or splenic sequestration, although these still accounted for the majority. Some simply had infection, gastrointestinal bleed, or other problems. ■

Clinical Trial Validates First Pediatric Stroke Severity Scale

BY SHERRY BOSCHERT

FROM THE INTERNATIONAL STROKE CONFERENCE

LOS ANGELES – For the first time, a pediatric stroke severity scale has been validated in a prospective clinical trial.

The study in 15 North American medical centers showed excellent interrater reliability when neurologists used a pediatric version of the National Institutes of Health Stroke Scale for adults to examine children aged 2-18 years with acute arterial ischemic stroke.

The neurologists used the Pediatric NIH Stroke Scale (PedNIHSS) on 113 patients who were examined daily from admission to discharge, or day 7 of hospitalization.

VITALS

Major Finding: A pediatric version of the NIH Stroke Scale demonstrated excellent interrater reliability in a prospective validation study.

Data Source: Pediatric neurologists at 15 North American medical centers tested the PedNIHSS by using it to examine 113 children with acute arterial ischemic stroke, with interrater reliability tested in 25 patients.

Disclosures: Dr. Ichord and one of her associates in the study are on the clinical event committee for the Berlin Heart Trial for pediatric ventricular assist devices.

The PedNIHSS helps clinicians with clinical decision making and helps them to prepare and counsel parents.

DR. ICHORD

Interrater reliability was tested in a subset of 25 patients who underwent simultaneous examinations by two pediatric neurologists. Characteristics of the subgroup were similar to those of the entire cohort, Dr. Rebecca N. Ichord reported at the conference.

The simultaneous raters' scores were identical in 60% of ratings and were within a 1-point difference in 84% of ratings (Stroke 2011;42:613-7).

Research into potential ways of preventing or treating childhood stroke has been stymied in the past by the lack of a validated and reliable pediatric stroke scale. The PedNIHSS provides a way to index the severity of a child's stroke, to make comparisons across treatment groups, and to get a baseline for predicting outcome, said Dr. Ichord, director of the pediatric stroke program at the Children's Hospital of Philadelphia.

Clinicians, too, have wanted such a scale. "I have been asked over and over again [for a pediatric stroke scale] by clinicians who want to have a method of describing the severity of a child's stroke," Dr. Ichord said at the meeting, which was sponsored by the American Heart Association. "It helps them with clinical decision making. It helps them to prepare parents and counsel parents."

Characteristics of the patients and the strokes in the study were similar to those reported in previous pediatric stroke cohort studies, which suggests the current findings are generalizable and the PedNIHSS should be applicable in other settings. Because all of the raters in the current study were pediatric neurologists or trainees, a separate study is needed to assess the PedNIHSS in the hands of other specialists, she said.

The pediatric version also found good interrater reliability for facial weakness, dysarthria, and ataxia, which was not seen with the adult stroke scale. The reasons for this difference are unclear.

The use of the pediatric scale is limited to 2-18 years because younger children have limited language abilities, which are needed for use of the PedNIHSS. Neonates and children younger than 2 years of age with acute ischemic stroke may require a scale with less emphasis on focal sensorimotor deficits, the investigators suggested. ■

The Pediatric NIH Stroke Scale provides a way to index the severity of a child's stroke, to make comparisons across treatment groups, and to get a baseline for predicting outcome.

A video interview with Dr. Ichord about the scale can be viewed by using the QR code, or by visiting www.clinicalneurologynews.com.