Cultures Not Obtained

Children *from page 1*

from the 2001-2004 Hospital Ambulatory Medical Care Survey, specifically ED visits among children less than 3 years of age. The researchers included all patients with fever listed as the reason for the visit as well as those in the ED for other reasons who had a documented temperature of at least 100.4 degrees Fahrenheit.

Dr. Johnson also looked at several patient factors, including age, acuity, race/ethnicity, and sex, and whether the patient was admitted to the hospital or transferred elsewhere. Hospital-specific factors considered in the analysis included location—urban or rural, and geographic region—public or private ownership, and status as a general or children's hospital.

Of the 37,000 ED visits included in the national survey, 4,358 involved children with either subjective or objective evidence of fever, and Dr. Johnson's study included those patients. In patients less than 3 months of age, blood cultures were obtained in 33.3% of cases and urine cultures in 24.7% of cases, Dr. Johnson said at the meeting, which was sponsored by the Society of Hospital Medicine, the American Academy of Pediatrics, and the Academic Pediatric Association. The numbers for older children "were significantly less," she said.

Children who were eventually admitted to the hospital or transferred to another institution were 5.53-fold more likely to have a blood culture done than those who were not, and 2.89-fold more likely to have a urine culture. Also, children with higher temperatures were more likely to have blood cultures done, Dr. Johnson said.

General hospitals were less likely than children's hospitals to do any cultures. Hispanic patients were less likely to have blood cultures done, compared with non-Hispanic patients. Hospitals in the Northeast were less likely to obtain blood cultures, as were general hospitals and hospitals in nonmetropolitan areas.

For urine cultures, the patterns were similar, with patients who were younger and who had higher temperatures being more likely to receive urine cultures. In addition, male patients were more likely than females to receive urine cultures, a difference that was not noted with blood cultures, according to Dr. Johnson. Hospitals in the Northeast were more likely to obtain urine cultures; as with blood cultures, general and nonmetropolitan hospitals were less likely to obtain urine cultures.

Dr. Johnson noted several limitations of her study, such as the fact that it was a cross-sectional survey and provided "just a snapshot" of patients who came in to the ED.

"It's impossible to know from this data what happened before the patient came to the ED," she said.

"Did they have a blood culture obtained in their practitioner's office? It's [also] impossible to know what happened after they left the ED. Did they have blood cultures obtained after admission on the floor? We also don't know anything about outcomes [or] results of tests," Dr. Johnson added.

The data suggest that "more evidence is needed to guide laboratory evaluation of febrile infants," she concluded.

In response to a question, Dr. Johnson noted that a preliminary analysis found that the results did not change significantly if only patients with objective evidence of fever were included.

She also was asked whether some patients may not have had urine cultures taken because a urinalysis suggested that a culture was not necessary. Dr. Johnson said that she did not look at urinalysis data, but she did look at how many patients had complete blood counts taken in lieu of blood cultures, "and the frequencies were not terribly different."

Dr. Johnson said that she had no conflicts of interest. ■

Catheter Line Protocols Curb Infections in Pediatric ICUs

BY DENISE NAPOLI

A project aimed at improving catheter line maintenance reduced the overall rate of catheter-associated bloodstream infections to 1.2 per 1,000 line-days at the critical care unit at Children's National Medical Center in Washington.

Compared with the national 2006 pooled mean of 5.3 infections per 1,000 central line–days, "that's pretty good," Dr. Heidi Dalton said. She formerly headed the unit, which recently went 197 days without any patients developing catheter-associated bloodstream infections, and now is chief of critical care at Phoenix Children's Hospital.

The secret of the unit's success, according to Dr. Marlene Miller, is an approach that focuses on line maintenance rather than line insertion.

In adults, a catheter line is accessed relatively infrequently and infection rates are sharply reduced by relatively simple insertion standardization policies. But in children, catheter lines are accessed much more frequently—more than 30 times per day in some cases, said Dr. Miller, cochair of the Catheter-Associated Bloodstream Infections Project, run by the National Association of Children's Hospitals and Related Institutions (NACHRI).

"In children, we'll draw all our blood samples from the line so that the child doesn't have to have another painful needle stick. Every one of these 'creature comforts' to minimize the pain is extremely important" for pediatric patients, she said. Lines are difficult to insert in children, she added, and thus are often left in longer. "Although the child may look good today, tomorrow they might not look so good. Since it is very hard to put these types of lines in children, especially younger ones, we carefully consider when to remove the line."

Another variable is the location of line placement. With young children, "we might be hesitant to put a line in the neck region where they can grab it," said Dr. Miller, who is also vice chair of Quality and Safety at Johns Hopkins Children's Center in Baltimore.

PAULA DARTE/CHILDREN'S NATIONAL MEDICAL CENTER

The project has led to "a sustained improvement," Dr. Heidi Dalton said.

The frequency of access to pediatric lines and the duration of placement mean that best practices for line insertion aren't enough, she said. To lower the catheter-associated bloodstream infection (CA-BSI) rate, pediatric critical care teams must focus on line maintenance.

Children's National Medical Center succeeded in achieving reduced rates after becoming 1 of 27 hospitals around the country that enrolled in phase I of the NACHRI collaborative after it was initiated in October 2006. The collaborative was later expanded to include more than 60 pediatric intensive care units.

From the start of the project through October 2008, the 29 phase I teams at the 27 hospitals prevented an estimated 560 CA-BSIs and a possible 65 deaths. The group saved an anticipated $20 million in slightly over 2 years. Overall, the phase I participants achieved a sustained reduction in the CA-BSI rate from 5.9 per 1,000 line-days to 2.3 per 1,000 line-days, said Mitchell Harris, Ph.D., director of research and statistics at NACHRI.

The NACHRI program provides "bundles," or prompts for intensive care unit staff to ask themselves each time a line is accessed. For example, one prompt asks whether any medications can be converted from venous to oral administration, Dr. Miller said. Another bundle offers evaluation tools and encourages critical care teams to frequently assess whether a line can be removed.

Nurses and other staff are also instructed about the cleaning and changing of the catheter line's cap (different protocols apply according to whether the line has most recently been used for feeding, medication, or blood drawing), the changing of the dressing at the insertion site, and the methods of clearly communicating the status of each aspect of central line care for each patient to the nurses in the next shift.

"It's a lot of work, but this is the only statistically significant predictor we have: If you do maintenance care better, you're significantly more likely to have a lower CA-BSI rate in pediatric patients," Dr. Miller said.

Dr. Dalton said that the hospital's adoption of a minocycline/rifampin-impregnated line designed for children, the Cook Spectrum (Cook Medical), as well as a change to chlorhexadine skin scrub and the use of the Biopath (Johnson & Johnson Inc.), were completed during the study period. These factors may have played a role in the reduction of BSIs noted at Children's National Medical Center.

Just participating in the collaborative drives infection reductions, she added. "All the hospitals in that collaborative make their data transparent [to each other]," she said. "So you're not just 'unit 22.' Everyone knows [unit 22] is Children's National Medical Center data. The peer pressure of the network has really made a sustained improvement in our infection rate."

Also, "every other month or every other quarter, [participants] have a Web call and talk about ideas. And then twice a year we get together as a group," Dr. Dalton said. This open channel of communication has led to best practices in other areas. For example, "the last two bloodstream infections in our ICU have been in kids that had long-term percutaneous lines" as opposed to more common central lines. "So we just had a meeting with all our [percutaneous] line people."

Phase II of the NACHRI program enrolled 25 additional hospitals, and phase III will start this fall.

Dr. Dalton declared that she has no conflicts of interest to disclose in relation to her use of the Cook Spectrum catheter, Biopatch, or chlorhexidine. ■

For more information about the NACHRI project, visit www.childrenshospitals.net.