Clinical News

Emergency docs hot on fever studies

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AT THE ADVANCED PEDIATRIC EMERGENCY MEDICINE ASSEMBLY

LAKE BUENA VISTA, FLA. – Fever in little ones is a hot topic in recent medical literature, and Dr. Richard Cantor made it a prime focus of his literature review.

• **What's that bug?** Suspected urinary tract infections from *Escherichia coli* are a top indication for an infant fever workup (Pediatr. Emerg. Care 2012;28:125-30).

Michelle G. Sullivan/IMNG Medical Media
Dr. Richard Cantor

A 2011 chart review looked at 207 infants aged 2-60 days. None of the youngest babies – those aged 28 days or less – had a positive lumbar puncture, and less than 3% had a positive blood culture. But about 11% grew *E. coli* in a urine culture.

The picture was a little different in the older group. Among these babies, 2% had positive cerebrospinal fluid and 1.5% a positive blood culture. But again, urinary tract infections were most common, affecting slightly more than 8% of the group. And again, the offender was *E. coli*.

No child had a culture positive for *Hemophilus influenzae*, and only one grew *Streptococcus pneumoniae* – good news that might reflect immunization-related herd immunity – and something emergency department docs can only hope will continue, said Dr. Cantor, director of pediatric emergency services at Upstate University Hospital in Syracuse, N.Y.

What about fevers without an obvious source? Lots of infants may not be getting the right tests – or even any tests (Pediatrics 2011;128:e1368-75).

A 4-year review of the National Hospital Ambulatory Medical Care Survey looked at what patient characteristics increased the chance of getting a complete blood count and a laboratory workup for a urinary tract infection.

No tests at all were ordered for more than half of the children in the study. Just 20% received a complete blood count (CBC) and 17%, a urinalysis. Even if some strikingly common risk factors were present, including female gender and a higher fever, only 42% of the patients

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had a urinalysis ordered. A quarter of the patients got an antibiotic, with about 7% being ceftriaxone.

Three characteristics stood out as increasing the likelihood of a diagnostic test: female gender, a higher temperature, and living in a zip code zone associated with a higher median income.

How well do lab tests predict bacterial infections in well-appearing babies who have a fever? The results of a 2010 study show once again that "neonates are the group you just can't trust," Dr. Cantor said (Pediatr. Infect. Dis. J. 2010;29:227-32).

The observational study looked at the ability of common tests, including white cell and neutrophil counts, as well as C-reactive protein (CRP), to detect severe bacterial infections in relation to fever duration.

The study included 99 babies aged 7-28 days. Most (62) had normal lab markers at presentation, but none of the three tests were highly predictive of a severe bacterial infection.

Repeating the tests at 12 hours improved their predictive value – especially for CRP, which rose from an area under the curve of 0.78 to 0.99, and neutrophil count, which rose from 0.77 to 0.85. The white blood cell count remained a very unreliable marker, with an area under the curve of 0.59 at admission and 0.79 at 12 hours.

The findings speak to the normal, somewhat delayed immune reaction of a newborn. "These tests won't give you the numbers you need to make a decision in the emergency department," Dr. Cantor said. Treat presumptively, but give the baby a chance to ramp up the defense department, and test again.

• **Rash decision?** It takes 9.5 years of data to show that infants with localized purpura and/or petechiae and no fever aren't likely to have any serious problems (Pediatr. Emerg. Care 2012;28:503-5).

A nearly century-long data review identified 36 otherwise-well babies (mean age, 4 months) who presented with localized purpura and/or petechiae of the lower limbs; about two-thirds had bilateral involvement. Almost all of the children had labs done, including CBC, coagulation profile, CRP, and blood cultures. All of these tests turned out to be normal.

Nine patients were admitted for observation, and only one of those showed progression; the diagnosis was acute hemorrhagic edema of infants. The rest of the patients were thought to have had some mechanical reason for the rash, like a tourniquet-type mechanism, perhaps due to a too-tight diaper.

"The take-home is that unless the rash progresses, there's probably a benign etiology," Dr. Cantor said. Some additional study could determine whether observation is sufficient, or if a coagulation profile is in order for these little ones.

• **Meningitis issues.** Petechiae can also spark the meningitis worry, but neither spots, signs, nor symptoms will identify every patient who needs a confirmatory spinal tap, according to a 2011 study (Pediatr. Emerg. Care 2011;27:196-99).

The chart review comprised 108 children aged 2 months to 16 years, all of whom had clinically suspected meningitis. Slightly more than half (58) had a confirmed case, and 52 of these were aseptic.

The sensitivity of classical symptoms wasn't great – 76% for headache, 71% for vomiting, and 88% for photophobia. But the specificity was even worse: 53%, 62%, and 28%, respectively.

Nuchal rigidity was a better indicator, present in 66% of the positive children. But 33% of the children without meningitis also had the sign. None of those without meningitis had Brudzinski's or Kernig's sign, but neither was it common among those who did have the disease. Only 51% had Brudzinski's sign and 27% Kernig's sign. Bulging fontanel was even less frequent – just half of the positive group had it, and the positive predictive value was only 38%.

When it comes to tapping, everyone wants to get it right the first time. The question is how to maximize that chance. A 2010 prospective study looked at how positioning maximizes the opening of the interspinous space (Pediatrics 2010;125:e1149-53). The study was small, with only 28 children (median age, 5 years). The investigators placed each child in five different positions (lateral, lateral flexed, lateral flexed with neck flexion, sitting, and sitting flexed) and used a bedside ultrasound to determine the space between L3-L4 and L4-L5.

Sitting flexed was the clear winner, opening the space a mean of 2.38 cm – significantly more than sitting alone (2.28 cm), lateral flexed (2.27 cm), lateral flexed with neck flexion (2.26 cm), and lateral without flexion (2.05 cm).

"Everyone says that the most important factor in a successful LP is the one who holds the child," Dr. Cantor said. "This shows that flexing the knees and the neck doesn't open up the space as much as simple flexed sitting."

Dr. Cantor had no financial disclosures.

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