

Systematic Sepsis Screening Shows Efficacy

BY MITCHEL L. ZOLER

FROM THE ANNUAL MEETING OF THE
SURGICAL INFECTION SOCIETY

LAS VEGAS — Systematic, twice-daily assessment of postsurgical patients by registered nurses using an inflammatory screening tool ruled out sepsis in some patients and was modestly effective for identifying sepsis in others, in a single-center study of 959 patients.

Regular screening of patients for sepsis using the systemic inflammatory response syndrome (SIRS) method “is a sustainable process” that has now been used at the Methodist Hospital, Houston, for 3 years, Dr. Laura J. Moore said.

The screening approach, which uses three sequential evaluation steps by three different staff members, was initially applied to patients in the surgical intensive care unit before it was rolled out to non-ICU, postoperative patients on the surgical floor. The Methodist staff now uses the screening tool in two additional wards, said Dr. Moore, a surgeon and medical director of the wound care service at Methodist.

The initial step of the screening scheme takes about 30 seconds. An additional 5-7 minutes is needed to evaluate patients who score positive on the screen and require further assessment. “If you can prevent needless transfer of patients to the ICU, it’s a tremendous benefit to the hospital and to patients,” she said. In addition, systematic, routine screening aids in the early identification of sepsis, which is otherwise problematic because

VITALS

Major Finding: Systematic, twice-daily sepsis screening of postoperative patients using the SIRS score had a 16.3% positive predictive value and a 99.9% negative predictive value.

Data Source: Single-center study of 959 patients hospitalized during May-October 2009.

Disclosures: Dr. Moore and her associates had no relevant disclosures.

the early signs—such as oliguria, hypothermia, and altered mental status—are nonspecific. “When sepsis is missed, it delays the start of treatment,” she noted.

The three-part screening tool starts with a nurse calculating a disease severity score for each patient twice a day using a detailed version of the SIRS score. Like conventional SIRS scores, the Methodist tool rates four clinical parameters: heart rate, temperature, respiratory rate, and white blood cell count. Each criterion is scored on a scale of 0-4, which means a patient’s overall score ranges from 0 to 16. (See box.) The screening cutoff used by the researchers flags patients who score 4 or higher for further sepsis assessment.

In step two, a nurse practitioner or a resident evaluates the patient for six different possible sites of infection: vascular access, pulmonary, abdominal, skin and soft tissue, urinary tract, or other. Finally, an attending physician assesses patients with indications of a site-specific infection for a definitive diagnosis of sepsis.

This scheme was first validated in a study of 920 surgical ICU patients hospitalized at Methodist during 2007. Among these patients, who had a sepsis prevalence of 12.2%, the three-step screen had a sensitivity of 96.5%, specificity of 96.7%, positive predictive value of 80.2%, and negative predictive value of 99.5%. During the period of screen use in 2007, sepsis-related mortality in the ICU patients fell to 23.3%, down from 35.1% in 2006 (J. Trauma 2009;66:1539-46). In contrast, there was no change in mortality during 2007 compared with 2006 in the emergency department, cardiac ICU, or medical ICU units, where the sepsis screen was not used.

Dr. Moore and her associates introduced the screen onto the surgical floor in May 2009, and during the first 6 months they applied it to 959 patients. The average age of the patients was 57 years, and about two-thirds were women. The sepsis prevalence was 1.7%.

A total of 55 patients had a score of 4 or higher on the initial screening tool; 16 of these had sepsis, including 2 with severe sepsis. One patient died from sepsis. The results meant a sensitivity of 99.9%, specificity of 91.3%, positive predictive value of 16.3%, and negative predictive value of 99.9%. ■

Simple, Practical Tool Needs More Work

MY TAKE This is a novel, interdisciplinary screening routine that involves the nursing staff. I am seduced by the simple and practical application of this tool. It excludes sepsis extremely well, with a negative predictive value of 99.9%. But the numbers suggest there is more work to be done. In the low-incidence population assessed, the screen provided only a small improvement over guessing every time that patients had no sepsis. Guessing no for all these patients would have been correct 98.3% of the time because the actual sepsis incidence was 1.7%. ■

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Methodist's Systemic Inflammatory Response Syndrome (SIRS) Scoring

VALUES TO SCORE

Parameter	0 points	1 point	2 points	3 points	4 points
Heart rate (bpm)	70-109	NA	55-69; 110-139	40-54; 140-179	39 or less; 180 or greater
Temperature (°C)	36-38.4	34-35.9; 38.5-38.9	32-33.9	30-31.9; 39-40.9	29.9 or less; 41 or greater
Respiratory rate (breaths/min)	12-24	10-11; 25-34	6-9	35-49	5 or less; 50 or greater
White blood cell count (kcell/mm ³)	3-14.9	15-19.9	1-2.9; 20-39.9	NA	Fewer than 1.0; 40 or greater

Note: Patients with a score of 4 points or higher undergo additional evaluation for possible sepsis; NA, not applicable. Source: Dr. Moore

Nosocomial *C. difficile* Common in Pneumonia Patients

BY BRUCE JANCIN

FROM THE ANNUAL EUROPEAN CONGRESS OF
CLINICAL MICROBIOLOGY AND
INFECTIOUS DISEASES

VIENNA — The three major guideline-recommended, empiric antibiotic strategies for community-acquired pneumonia are associated with similar rates of nosocomial acquisition of *Clostridium difficile*, according to a prospective, observational study.

The nosocomial *C. difficile* acquisition rates documented in the Dutch study—11.2% overall and 7.2% for the more worrisome toxigenic strains—are far from inconsequential. In the United States, with an estimated 1 million hospital admissions annually for community-acquired pneumonia (CAP), the toxigenic-strain acquisition rate extrapolates to 72,000 new carriers of toxigenic *C. difficile* per year, Dr. Anke H. Bruns said.

Of 107 Dutch patients hospitalized with severe CAP, 41% were treated with moxifloxacin, 44% with beta-lactam monotherapy, and the rest with beta-lactam/macrolide combination therapy. Participants were followed for 30 days, with stool samples collected on admission, 5 days later, 3 days after completion of antibiotic therapy, and on day 30, reported Dr. Bruns of University Medical Center Utrecht (the Netherlands).

Infectious Diseases Society of America guidelines recommend either of two antibiotic regimens as first-line treatment for CAP patients: monotherapy with a fluoroquinolone or combination therapy with beta-lactam and macrolide. Dutch

guidelines recommend monotherapy with a fluoroquinolone or beta-lactam, or beta-lactam with a macrolide or fluoroquinolone. Dr. Bruns and her coworkers found that the regimens are equal in associated risks of acquiring *C. difficile* colonization.

The prevalence of *C. difficile* carriage at admission was 9.4%.

DR. BRUNS

these patients were asymptomatic, and therefore they constitute an important reservoir for the spread of disease, especially because skin contamination was also involved in several cases,” she said.

In a multivariate analysis, the parameters strongly associated with *C. difficile* carriage were the use of intravenous

antibiotics for more than 7 days (associated with a 3.9-fold increased risk), hospitalization within the previous 3 months (4.1-fold increased risk), and tube feeding (4.4-fold increased risk).

The study has several major clinical implications, Dr. Bruns noted. No one antimicrobial proved to be linked with increased risk for emergence of *C. difficile*, which argues against banning any specific agent. Instead, according to Dr. Bruns, it makes more sense to implement strategies aimed at reducing overall antibiotic use in CAP patients.

The other take away point is that hospitalized CAP patients have a roughly 1-in-10 baseline prevalence of *C. difficile* carriage. Routine screening and institution of appropriate hygiene measures are worth considering, Dr. Bruns said. ■

Disclosures: Dr. Bruns disclosed having no financial conflicts regarding the CAP study.

