

# Consider Comorbidities in Abdominal Infections

BY JEFF EVANS

SARASOTA, FLA. — Preexisting conditions may be better predictors of the outcomes of intra-abdominal infections than are the source or type of infection, according to a single-center, retrospective study.

The results suggest that interventions for intra-abdominal infections (IAIs) should focus on treating the burden of chronic disease in patients rather than on preventing specific sources or types of IAIs, Tazo Inui said at the annual meeting of the Central Surgical Association.

Community-acquired IAIs (CIAIs) tend to occur most frequently with complicated appendicitis, but nosocomial IAIs (NIAIs) have been reported to have worse outcomes, said Mr. Inui, a fourth-year medical student at Case Western Reserve University, Cleveland.

In a review of 452 patients with IAIs during 1999-2007 at MetroHealth Medical Center, Cleveland, Mr. Inui and his associates, led by Dr. Mark Malagoni, compared 234 patients with a CIAI and 218 with an NIAI. An NIAI was defined

as an infection diagnosed 48 hours or more after admission for an unrelated diagnosis or within 4 weeks of an operation or intervention for an IAI.

The investigators reviewed patients' scores on the Charlson Comorbidity Index, which is designed to predict mortality based on the burden of a patient's comorbid disease, as well as their multi-organ dysfunction (MOD) score, which is intended to measure dysfunction in six organ systems and has been shown to correlate strongly with mortality, particularly in ICU patients, Mr. Inui said.

Patients with CIAI most often presented with complicated appendicitis (52%), followed by colonic (26%) or small bowel (11%) sources of infection. NIAIs were associated most frequently with postoperative infection (44%), then colonic (29%) or small bowel sources (17%). NIAI patients also were significantly older than those with CIAI (53 vs. 50 years).

Patients were excluded from the study if they had been treated within 24 hours for a gastroduodenal perforation or within 12 hours for a traumatic intestinal perforation.

The investigators found that the 122 CIAI patients with complicated appendicitis were younger, had lower Charlson scores, and had lower preoperative MOD scores than did CIAI patients without complicated appendicitis. However, when they excluded CIAI patients with complicated appendicitis from the analysis, there were no differences in preoperative characteristics between NIAI patients and CIAI patients without appendicitis.

Mr. Inui and his colleagues excluded patients with complicated appendicitis from further analyses because no one with that condition died, and only 7% of such patients required reintervention (surgery or percutaneous drainage).

Thus, among patients without appendicitis in the CIAI and NIAI groups, comparable rates of treatment failure—defined as death (8% vs. 9%, respectively) or the need for reintervention (21% vs. 21%)—and postoperative complications were seen.

"This observation suggests that patients with community-acquired and nosocomial infections are, in fact, more alike than previously reported," Mr. Inui said.

Mortality was independently predicted by the presence of catheter-related bloodstream infections, postoperative myocardial infarctions or arrhythmias, and an age of 65 years or older.

Even though Charlson scores of 2 or higher did not independently predict mortality, Mr. Inui noted that there was a stepwise increase in mortality according to Charlson score, such that mortality was less than 5% in patients with a score of 0, 10% with a score of 1-2, 12% with a score of 3-4, and 20% with a score of 5 or higher.

However, when patients with appendicitis were included in the analysis, treatment failure was independently associated with a nonappendiceal source of infection and a Charlson score of 2 or greater. Reintervention also was independently associated with a nonappendiceal source of infection, as well as a MOD score of 4 or greater on postoperative day 7.

Mr. Inui noted that he and his coinvestigators did not evaluate the results of cultures or the attempts to control the sources of infection. ■

## NGAL May Help Identify Renal Dysfunction in Suspected Sepsis

BY BRUCE JANCIN

NEW ORLEANS — Plasma neutrophil gelatinase-associated lipocalin shows promise as an early biomarker for development of acute renal dysfunction in patients presenting to the emergency department with suspected sepsis.

A rise in serially measured serum creatinine is the standard indicator of acute renal injury currently used in clinical practice, but it can be an unreliable and late-appearing biomarker, Dr. Nathan I. Shapiro said at the annual meeting of the Society for Academic Emergency Medicine.



Neutrophil gelatinase-associated lipocalin (NGAL) is a protein produced by activated neutrophils that increases in infectious illnesses and is further inducible during renal ischemia, explained Dr. Shapiro of Beth Israel Deaconess Medical Center, Boston.

He presented data from the Prospective Observational Emergency Medicine Study (POEMS) involving 661 adults who presented with suspected sepsis to 10 participating academic emergency departments. The primary outcome was development of acute renal injury as indicated by a rise in serum creatinine of more than 0.5 mg/dL within 72 hours after an initial measurement obtained upon arrival at the ED.

Of the 661 patients, 24 (3.6%) developed renal dysfunction within 72 hours, of whom 6 went on to require renal replacement

therapy. The median initial plasma NGAL among those who developed renal dysfunction was 456 ng/mL, compared with 144 ng/mL in those who did not.

NGAL was a strong predictor of subsequent renal dysfunction. A plasma NGAL greater than 150 ng/mL was 96% sensitive and 51% specific for renal dysfunction. Serum creatinine was a much less potent predictor; achieving a 96% sensitivity using creatinine required setting the cutoff at 0.7 mg/dL, which resulted in a poor specificity of 17%, Dr. Shapiro reported.

Plasma NGAL also predicted in-hospital mortality. In a multivariate analysis adjusted for patient age, sex, race, and serum creatinine level, the odds of in-hospital mortality increased threefold with each quartile for NGAL greater than the lowest.

The major study limitation was that only 24 cases of acute renal dysfunction occurred. Further studies with larger numbers of cases will be required, he concluded.

POEMS was funded by Biosite, now Inverness Medical Innovations Inc., which is developing a rapid plasma NGAL test. Dr. Shapiro received a research grant from the company to conduct the study. Abbott Laboratories is developing a urine NGAL test. Both tests are intended for early identification of patients at risk of developing acute renal injury after surgery, trauma, or critical illness, so that timely preventive therapy can be initiated. ■

**A plasma NGAL greater than 150 ng/mL was 96% sensitive and 51% specific for renal dysfunction.**

DR. SHAPIRO

## H1N1-Infected Health Care Staff Report Poor Infection Control

BY HEIDI SPLETE

None of 26 health care workers infected with the novel influenza A (H1N1) virus fully followed the Centers for Disease Control and Prevention's recommended infection control practices, based on CDC data presented at a press briefing.

"The single most important thing is that infectious patients be identified at the front door," said Dr. Michael Bell of the CDC's National Center for Preparedness, Detection, and Control of Infectious Diseases. "Identifying them up front is essential to let health care personnel know that they should be doing the things that we recommend," he said.

The CDC investigators determined that 13 (50%) of the 26 cases were contracted in health care settings, with 12 cases of transmission from patients to health care providers and 1 case of transmission from one health care provider to another.

A total of 11 providers of the 12 cases of patient-to-provider transmission reported their use of protective equipment when caring for a patient infected with the H1N1 virus. None reported always using gloves, gowns, and either a mask or an N95 respirator. Only three said they always wore a mask or N95 respirator, five said they always wore gloves, and none said they used eye protection.

The CDC's recommendations for health care personnel include staying home when ill, washing hands frequently, and using protective gear including surgical masks, N95 respirators, gloves, and surgical gowns, as well as eye protection.

The results suggest that health care providers aren't overrepresented among reported cases of the H1N1 virus so far.

The data emphasize the need for health care facilities to adhere to infection control recommendations, identify and triage potentially infectious patients, provide infection control resources, and train staff in infection control practices, the CDC researchers noted.

The study was limited by several factors, however, including potential recall bias, the small number of cases, and the lack of information about several infection control practices, including hand hygiene, the CDC researchers wrote (MMWR 2009;58:641-5).

Data on additional cases in health care providers are under review, Dr. Bell said.

Transmission of the H1N1 virus in the United States is expected to continue throughout the summer and increase in the fall, Dr. Daniel Jernigan, a medical epidemiologist in the CDC's Influenza Division, said during the briefing.

On its Web site, the CDC has posted H1N1 guidance for those attending summer camps, Dr. Jernigan said. ■