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INSIDE

Hospital Medicine Alert's physician editor, Kenneth P. Steinberg, MD, selected and reviewed the articles contained within this issue on August 7, 2006.

MRSA Hits the Streets

ABSTRACT & COMMENTARY

By Mary Elina Ferris, MD

Clinical Associate Professor, University of Southern California

Dr. Ferris reports no financial relationship to this field of study.

This article originally appeared in the June 29, 2006 issue of Internal Medicine Alert. *It was edited by Stephen Brunton, MD, and peer reviewed by Gerald Roberts, MD. Dr. Brunton is Clinical Professor at the University of California, Irvine, and Dr. Roberts is Clinical Professor of Medicine at Albert Einstein College of Medicine. Dr. Brunton is a consultant for Sanofi-Aventis and Ortho-McNeill, and Dr. Roberts reports no financial relationship relevant to this field of study.*

Synopsis: *Methicillin-resistant* Staphylococcus aureus *(MRSA) in the community was the cause of the majority of skin and soft tissue infections, and was predominantly of one strain different from MRSA of hospital origin.*

Source: King MD, et al. Emergence of Community-Acquired Methicillin-Resistant *Staphylococcus aureus* USA 300 Clone as the Predominant Cause of Skin and Soft-Tissue Infections. *Ann Intern Med*. 2006;144:309-317.

All staphylococcus isolates from community-acquired skin- and soft-tissue infections for 3.5 months from Grady Memorial Hospital and its affiliated clinics in Atlanta, Georgia, were analyzed, amounting to 389 specimens. Infection in hospitalized patients was considered community-acquired if it occurred within 72 hours of admission. Seventy-two percent of all *S. aureus* infections were found to be MRSA, and 87% of those fell into one group (USA 300) with a susceptibility profile demonstrating resistance only to beta-lactams and erythromycin and not to clindamycin, levofloxacin, trimethoprim-sulfa, or vancomycin.

They also analyzed the initial treatment choices made for these patients, and found that only 57% of infections were treated appropriately before sensitivity results were known. Among the MRSA patients, only 18% had been hospitalized during the previous year, suggesting that MRSA acquisition was most likely from the community and not the hospital. More black persons and younger persons had MRSA. Traditional risk

Financial Disclosure

Hospital Medicine Alert's physician editor, Kenneth P. Steinberg, MD, has no relevant financial relationship related to the material presented in this issue.

factors for MRSA, such as previous incarceration or day care attendance, were not seen in the available records for the MRSA-infected group.

COMMENTARY

This study in urban Atlanta shows that a particular clone of MRSA has become the most common cause of all community-acquired skin- and soft-tissue infections, which is clearly increasing based on studies in previous years. This clone remains sensitive to tetracyclines and trimethoprim-sulfa, which is not the case with the classic hospital-acquired MRSA. Other studies have confirmed these trends. Unfortunately, a 4-fold increase in clindamycin resistance, with the most common presentation being abscess and cellulitis, has also been confirmed.

Susceptibility patterns may vary regionally, so this research reminds us of the urgent need to culture community-acquired skin- and soft-tissue infections whenever possible to guide our treatment decisions. Drainage of abscesses may be the most important intervention,[2] but if there is no fluctuant collection of purulent material to be drained and the clinical setting suggests MRSA, a sulfa drug or tetracycline has been recommended as the best choice for initial empiric therapy.[3] Otherwise, treatment is guided by disease severity, clinical response, culture results and cost, but we should certainly be highly suspicious of MRSA in groups not previously thought to be at high risk. ■

Hospital Medicine Alert, ISSN 1931-9037, is published monthly by Thomson American Health Consultants, 3525 Piedmont Rd., NE, Bldg. 6, Suite 400, Atlanta, GA 30305.

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MARKETING PRODUCT MANAGER: Gerard Gernazian.

GST Registration Number: R128870672.
Periodicals postage paid at Atlanta, GA.
POSTMASTER: Send address changes to ***Hospital Medicine Alert***, P.O. Box 740059, Atlanta, GA 30374.

Back issues: $42. Missing issues will be fulfilled by Customer Service free of charge when contacted within one month of the missing issue's date.

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Questions & Comments
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CA-MRSA & CAP

ABSTRACT & COMMENTARY

By Stan Deresinski, MD, FACP
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Dr. Deresinski serves on the speaker's bureau for Merck, Pharmacia, GlaxoSmithKline, Pfizer, Bayer, and Wyeth, and does research for Merck.
This article originally appeared in the July 2006 issue of Infectious Disease Alert. *It was peer reviewed by Connie Price, MD. Dr. Price is Assistant Professor, University of Colorado School of Medicine. Dr. Price reports no financial relationships relevant to this field of study.*

Synopsis: *Seventeen cases of community acquired pneumonia due to* Staphylococcus aureus *are described. Most were methicillin resistant and caused severe disease with high mortality.*

Source: Hageman JC, et al. Severe Community-Acquired Pneumonia Due to *Staphylococcus aureus*, 2003-04 Influenza Season. *Emerg Infect Dis*. 2006; 12:894-899.

THE CDC IDENTIFIED 17 PATIENTS WITH COMMUNITY-acquired pneumonia (CAP) due to *S. aureus* by following up on reports from the Emerging Infections Network of the Infectious Disease Society of America during the 2003-2004 influenza season. The patients ranged in age from 3 months to 62 years (median, 21 years), and 5 (29%) had underlying diseases. All patients had an initial influenza-like illness, and 12 (71%) had laboratory-confirmed acute influenza virus infection. Only one had documented

receipt of influenza vaccine during 2003-2004. Twelve (93%) of 13 patients for whom data was available were hypotensive. One-fourth of patients had involvement of multiple lobes of the lung, and one-fourth had radiographic evidence of cavitation or necrosis; 31% had effusions/empyema. ICU admission was required by 81%; 62% required mechanical ventilation and 46% required chest tube placement. Five (29%) died, a median of 7 days (range, 3 to 73 days) after the onset of symptoms; one was dead on arrival at hospital.

Of the 13 *S. aureus* isolates available, 13 (76%) were methicillin-resistant (MRSA). All contained one or more toxin genes, but 11 of these had only the genes encoding the Panton-Valentine leukocidin. All the isolates were found to be of community-associated pulsed field types; 85% were USA300 (most subtype 0114) and the remainder were USA400.

COMMENTARY

This study is important in bringing 2 epidemiological strands together—the known increased risk of *S. aureus* as a cause of CAP complicating influenza virus infection and the emergence of novel strains of MRSA in the community. The cases described here were of remarkable severity, indicating a need for early initiation of appropriate antibiotic therapy and, thus, require awareness of the problem of community-acquired MRSA (CA-MRSA) among clinicians. These cases also demonstrate the importance of procuring specimens, including sputum for microbiological evaluation and examination of Gram stains, something which appears to be increasingly neglected.

Hageman and colleagues point out a warning published in 1959 that during influenza epidemics antibiotic therapy should included coverage of relatively antibiotic-resistant staphylococci.[1] At the time, of course, they were referring to penicillin-resistant organisms not MRSA, which had not yet been described (methicillin became available in 1959-1960). This warning remains valid at a time when virulent CA-MRSA are increasingly prevalent and, at the same time, acquiring resistance to additional antibiotics, including the respiratory fluoroquinolones. ■

Reference

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Use of Corticosteroids in Persistent ARDS

ABSTRACT & COMMENTARY

By James E. McFeely, MD

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Dr. McFeely reports no financial relationship to this field of study.

This article originally appeared in the July 2006 issue of Critical Care Alert. *It was edited by David J. Pierson, MD, and peer reviewed by William Thompson, MD. Dr. Pierson is Professor, Pulmonary and Critical Care Medicine, Harborview Medical Center, University of Washington, and Dr. Thompson is Staff Pulmonologist, VA Medical Center; Associate Professor of Medicine, University of Washington. Dr. Pierson and Dr. Thompson report no financial relationship relevant to this field of study.*

Synopsis: *A prospective randomized trial carried out over a 6-year period of time enrolled 180 patients with ARDS of at least 7 days duration, and randomized them to receive either methylprednisolone or placebo. There was no significant difference noted in mortality at 60 days, though there was some improvement in ventilator-free and shock-free days during the first 28 days in patients treated with steroids. Steroids were also associated with an increased risk of death if started more than 2 weeks after the onset of ARDS.*

Source: Steinberg KP, et al. Efficacy and Safety of Corticosteroids for Persistent Acute Respiratory Distress Syndrome. *N Engl J Med*. 2006;354:1671-1684.

CORTICOSTEROIDS HAVE BEEN STUDIED IN VARIOUS phases in the treatment of Acute Respiratory Distress Syndrome (ARDS), which is characterized by an inflammatory injury to the lung, resulting in acute hypoxemic respiratory failure. Four trials of steroids in early ARDS failed to show any improvement. However, several reports in small case series showed a possible benefit from moderate-dose steroids in patients with persistent ARDS, including a single-center study involving a small number of patients that suggested an improvement in lung function and survival. On this basis, the ARDS Network undertook a larger, multi-center, placebo-controlled, randomized study of steroids in patients with persistent ARDS.

Patients were enrolled between August 1997 and November 2003 at 25 hospitals in the ARDS network. Out of 4000 patients screened (3464 of whom

were eligible), 180 (5%) enrolled between day 7 and 28 after the onset of ARDS, and were randomly assigned in a double-blind fashion to receive either methylprednisolone or placebo. The initial demographic variables were similar between the 2 study groups except for gender (more men were assigned placebo). Methylprednisolone was administered as a single dose of 2 mg/kg of predicted body weight, followed by a dose of 0.5 mg/kg every 6 hours for 14 days. The dose was subsequently reduced to 0.5 mg/kg every 12 hours for 7 days, and then tapered. Tapering occurred more rapidly if fungal disease or septic shock developed, or if the patient improved to the point of having been extubated for at least 48 hours.

The study's primary end point was mortality at 60 days. Secondary end points included the number of ventilator-free and organ failure-free days, infectious complications, and markers of inflammation and fibroproliferation. The trial was initially designed to enroll 400 patients, but 2 years into the study sample size was changed based on low enrollment, as well as results of the contemporaneous low tidal volume ARDS net study.[1]

Based on an intention-to-treat analysis, there was no significant difference in mortality between the 2 treatment groups, either at the 60-day time interval (28.6% placebo, 29.2% methylprednisolone) or at 180 days. The steroid group experienced significantly more ventilator-free days than the placebo group during the first 28 days (14 days vs 24 days); they also had more shock-free days and showed improvements in oxygenation and respiratory system compliance as compared with the placebo group. However, patients in the steroid group were more likely to require reintubation (28% vs 9%). Further, patients among the steroid group who had ARDS for more than 13 days before enrollment showed a significantly increased mortality rate.

COMMENTARY

The ARDS Network is to be commended for their perseverance in attempting to answer the question of steroid use in late ARDS. However, while the results of this paper might suggest that steroids (at least at the dose and timing used in the study) are unfortunately not going to be of use for the fibroproliferative phase of ARDS, problems with recruitment and the length of time it took to complete enrollment raise questions about the applicability of this result.

This study was open for enrollment at 25 hospitals for 2296 days. During this time, the practice of critical care medicine was in rapid evolution. While the study was initially conducted in parallel with the ARDS low-tidal-volume study, subsequent results from the latter study[1] led researchers to decrease enrollment and include additional covariate analyses. In addition, many changes in critical care practice have had a direct impact on the primary and secondary end points of the study, including the use of vasopressin for shock, tight glycemic control, early goal-directed therapy, use of activated protein C (Xigris) for sepsis, and development of protocols for weaning and use of sedatives. Each of these could be expected to have an effect on overall mortality of similar magnitude to steroid use in ARDS. Moreover, only 5% of patients who were eligible for the study (180/3464) were actually enrolled. While there were appropriate reasons for this, the exclusions do raise a question regarding the applicability of this result to a larger population.

What can be concluded from this study is that starting steroids more than 2 weeks after the onset of ARDS is probably a bad idea, and likely increases the risk of death. This paper also documented high incidences of neuromyopathy. While there was no difference in frequency between the 2 groups, patients on steroids seem to have more severe myopathy. This was perhaps complicated by the increased frequency of hyperglycemia, also seen in the corticosteroid group. Fortunately, no significant increase in infectious complications was identified.

Reduction in the excessive inflammatory response to ARDS still seems to be a promising therapeutic target in ARDS. It may be that corticosteroids, however, are too blunt an instrument in this situation. In the 10 years since this trial was first designed, we've come a long way in identifying inflammatory and anti-inflammatory genes and mediators. This trial helps narrow the time window for optimal anti-inflammatory therapy. Hopefully, the next trial will be performed with a more targeted therapy applied over a broader range of patients and will be brought to conclusion more quickly. ■

Reference

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Does Early Enteral Feeding Improve Outcomes in Medical ICU Patients?

ABSTRACT & COMMENTARY

By David J. Pierson, MD

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Dr. Pierson reports no relevant financial relationship relevant to this field of study. This article originally appeared in the July 2006 issue of Critical Care Alert. *It was peer reviewed by William Thompson, MD.*

Synopsis: *In a retrospective analysis, medical ICU patients requiring mechanical ventilation for 2 days or more had lower ICU and hospital mortality (but more ventilator-associated pneumonia) if they were begun on enteral feeding during that time than if they were not.*

Source: Artinian V, et al. Effects of Early Enteral Feeding on the Outcome of Critically Ill Mechanically Ventilated Medical Patients. *Chest*. 2006;129:960-967.

Artinian and colleagues performed a retrospective analysis on a large, prospectively-acquired database from ICUs across the United States to examine the effect of initiating early enteral feeding on outcomes in non-surgical, mechanically-ventilated ICU patients. They used patient data from Project IMPACT CCM, Inc (www.cerner.com/piccm/about.html), a proprietary ICU data collection and management system. After exclusion of patients who were weaned or died within 48 hours, or were predicted to have a contraindication to enteral feeding (such as those with gastrointestinal bleeding, ileus, or pancreatitis), data from 4049 patients who were ventilated for at least 2 days were used in the study. Patients in whom the records showed that enteral feeding was begun within the first 48 hours of commencement of ventilatory support (n = 2537) were compared to those without such documentation (n = 1512). Artinian et al determined associations between early feeding status and ICU and hospital mortality, ventilator-free days, ICU length of stay, and the incidence of ventilator-associated pneumonia (VAP), using a standardized definition. They also attempted to adjust for imbalances in the patient groups by matching a subset of 1264 of the early-feeding patients with an equal number of non-fed patients by means of a propensity score.

The 63% of patients who received early feeding were significantly older, more likely to be white, and to have been admitted to the ICU for respiratory reasons. Early feeding patients were also less seriously ill, as measured by MPM-0 and SAPS II scores. ICU and hospital mortality were lower in the early feeding patients (18% vs 21%; $P = 0.01$, and 29% vs 34%; $P = 0.001$, respectively). The mortality differences were primarily among the most seriously ill quartile of the early feeding group, and these persisted in the secondary analysis using propensity score. Early feeding patients had longer ICU lengths of stay (10.9 vs 10.2 days; $P = 0.01$) and also had an increased risk of VAP in all adjusted analysis, but there was no difference in 28-day ventilator-free days. In the several prediction models used, early enteral feeding was associated with an approximately 20% decrease in ICU mortality and a 25% decrease in hospital mortality. Artinian et al recommend early enteral feeding for medical ICU patients, based on their conclusion that such an approach to nutritional support reduces ICU and hospital mortality primarily because of improvements in the sickest patients.

COMMENTARY

The clinical importance of early nutritional support in the ICU remains controversial. Food is good, and it would seem to be self-evident that feeding critically ill patients would be good for them, yet this has been surprisingly difficult to establish convincingly. Poorly nourished patients do less well than those with better nutritional status, but this is not the same as saying that early, aggressive feeding across the board will improve outcomes. A systematic review of studies in critically ill patients with abdominal surgery, hip fracture, trauma, and burns concluded that early enteral feeding was beneficial in those groups.[1] However, the only previous study[2] in mechanically-ventilated medical ICU patients—a single-center randomized controlled trial—found that early institution of full enteral nutritional support was associated with increases in the rates of VAP and *Clostridium difficile*-associated diarrhea, longer stays in the ICU and in the hospital, and no differences in mortality. The results of this study differ strikingly from those of the latter.

In the hierarchy of evidence-based medicine, the findings of appropriately-powered, randomized, clinical trials—or better yet, of meta-analysis of several such trials—carried out with patients similar to those of present interest and using clinically relevant end points, are at the top of the list. The results of

smaller clinical trials and prospective studies with surrogate end points, data from retrospective studies, and the findings of studies on animals are placed progressively lower on the list. This is not to say that a retrospective study can't get it right or that the results of such a study should not be taken seriously. A retrospective analysis with findings at variance with those of a randomized, clinical trial does present the clinician with a dilemma, however.

Artinian et al acknowledge the present study has several limitations. The only thing in the database about the nutritional management of the patients is whether enteral feeding was initiated in the first 48 hours of mechanical ventilation; how much was given or whether it was tolerated is unknown, as are the nutritional formula used and whether the tube was gastric or postpyloric. Perhaps more importantly, as in any retrospective analysis, it is not possible to know for sure why early enteral feeding was done in some patients and not others. Although Artinian et al went to great lengths to eliminate confounding by indication, the possibility remains that something important about the early-feeding patients that was not included in the database was different. As one of my colleagues likes to remind me, sicker patients don't do as well as patients who are less sick. Or perhaps there was something different about the medical ICU physicians who started their patients on early enteral feeding as compared with those who did not.

These issues notwithstanding, this study provides evidence for improved outcomes among medical ICU patients who require mechanical ventilation for 2 days or more—especially those who are more seriously ill—if they are begun on enteral feeding during that time. In the absence of contraindications, it would be reasonable to attempt enteral feeding under such circumstances, although the state of the evidence at present is that we do not know for sure whether this is really in our patients' best interests. ■

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Post-Chemotherapy Fatigue and the Role of Anti-Inflammatory Treatment

ABSTRACTS & COMMENTARY

By William B. Ershler, MD

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This article originally appeared in the July 2006 issue of Clinical Oncology Alert. *It was peer reviewed by VR Veerapalli, MD. Dr. Veerapalli is Staff Clinician, INOVA Fairfax Cancer Center, Falls Church, VA. Dr. Veerapalli reports no financial relationship relevant to this field of study.*

Synopsis: *Fatigue occurs commonly in patients with cancer, particularly when receiving chemotherapy or radiation. Furthermore, in long term survivors, persistent fatigue occurs in up to one third. Although anemia is one contributing factor, fatigue certainly occurs in its absence as well. Two recent reports are reviewed; one addressing the mechanisms and biochemical markers of persistent fatigue, and the other introducing a novel therapeutic approach directed at chemotherapy-associated fatigue. It is quite apparent that dysregulation of inflammatory mechanisms accounts for some component of fatigue and anti-inflammatory treatments may be of great value.*

Sources: Collado-Hidalgo A, et al. Inflammatory Biomarkers for Persistent Fatigue in Breast Cancer Survivors. *Clin Cancer Res*. 2006;12:2759-2766; Monk JP, et al. Assessment of Tumor Necrosis Factor Alpha as an Intervention to Improve Tolerability of Dose-Intensive Chemotherapy in Cancer Patients. *J Clin Oncol.* 2006; 24:1852-1859.

FATIGUE, BOTH ASSOCIATED WITH CHEMOTHERAPY administration and persistent thereafter, has become a major concern for cancer patients. In fact for breast cancer survivors, it may occur in as many as 30% for as long as 5 years.[1] Anemia is one major factor, particularly during treatment, but fatigue is also common in patients with normal hemoglobin levels, and for patients with anemia, it may persist after raising hemoglobin to normal or near normal levels. Thus, there has been an increased emphasis on understanding the cancer-fatigue syndrome and recent reports have shed some light.

Collado-Hidalgo and colleagues from UCLA have found elevated serum markers of proinflammatory cytokine activity in breast cancer survivors 3 to 5 years after completion therapy and in the absence of detectable residual disease.[2,3] This group has gone on to describe biomarkers of dysregulated inflammation that may prove useful in both understanding the pathogenesis of persistent fatigue in cancer survivors and as a marker for which patients are likely to experience it. In the current report, leukocyte subsets, plasma inflammatory markers, and ex vivo proinflammatory cytokine production were assessed in 50 fatigued and non-fatigued breast cancer survivors recruited > 2 years after successful primary therapy. Fatigued survivors were distinguished from non-fatigued survivors by increased monocyte production of IL-6 and TNF following lipopolysaccharide stimulation, elevated plasma IL-1ra and soluble IL-6 receptor, decreased monocyte cell-surface IL-6R, and decreased frequencies of activated T lymphocytes and myeloid dendritic cells in the peripheral blood (all $P < 0.05$). Multivariate linear discriminant function analysis identified 2 immunologic markers, the ratio of sIL-6R to monocyte-associated IL-6R and decreased circulating CD69 + T lymphocytes as diagnostic of fatigue ($P = 0.0005$), with cross validation estimates indicating 87% classification accuracy (sensitivity = 83%, specificity = 83%).

In a separate report, Monk and colleagues from Ohio State University describe a pilot trial of etanercept (a TNF-decoy receptor) to combat the fatigue associated with dose-intensive chemotherapy. Initially, 12 patients with advanced malignancies were randomly assigned to docetaxel at 43 mg/m^2 weekly (cohort A) or the same docetaxel dose plus added etanercept (25 mg subcutaneously, twice weekly) (cohort B). Subsequently, higher doses of docetaxel in combination with etanercept were evaluated. For those receiving added etanercept, escalation of docetaxel to 52 mg/m^2 weekly resulted in neutropenia, not fatigue, as the limiting adverse effect and the addition of filgrastim permitted the maintenance of dose-intensity. Patients randomly assigned to receive etanercept/docetaxel self-reported less fatigue ($P < 0.001$), and the added etanercept was shown to have no influence on docetaxel pharmacokinetics.

COMMENTARY

Dysregulated proinflammatory factors have been implicated in a wide range of clinical disorders, many of which are characterized by fatigue. During acute inflammation, cytokines such as IL-6, TNF and interferon have all been associated with constitutional symptoms including fever, malaise, cachexia, and profound fatigue. Cancer patients, by virtue of the inflammatory nature of the underlying disease, or by the pro-inflammatory consequences of chemotherapy and radiation, are particularly susceptible to cytokine dysregulation and its consequences. The interventional study of TNF blockade (by etanercept) as an adjunct to weekly docetaxel therapy is intriguing. Not only was fatigue less, but patients were able to tolerate higher doses and, thereby, theoretically achieve more optimal responses.

Although it is unclear that persistent fatigue exists in cancer survivors long after completion of therapy (as many as 30% of breast cancer survivors), is of the same mechanism as that occurring in patients with active disease under treatment; it would seem probable that inflammatory mechanisms are also involved. Thus, long-term anti-inflammatory treatment (possibly with non-steroidal anti-inflammatory drugs, or even with parenteral more specific modulators such as etanercept) would seem worthy of clinical investigation in this setting. ■

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2. Bower JE, et al. Fatigue and Proinflammatory Cytokine Activity in Breast Cancer Survivors. *Psychosom Med*. 2002;64:604-611.
3. Bower JE, et al. T-cell Homeostasis in Breast Cancer Survivors with Persistent Fatigue. *J Natl Cancer Inst.* 2003;95:1165-1168.

Cost-Effectiveness of BNP Measurement in Acute Dyspnea

ABSTRACT & COMMENTARY

By David J. Pierson, MD

This article originally appeared in the July 2006 issue of Critical Care Alert. *It was peer reviewed by William Thompson, MD.*

Synopsis: *This study in patients presenting to the emergency department with acute dyspnea showed that rapid BNP testing is cost-effective during the initial hospital encounter as well as at 180 days.*

Source: Mueller C, et al. Cost-Effectiveness of B-Type Natriuretic Peptide Testing in Patients with Acute Dyspnea. *Arch Intern Med*. 2006;166:1081-1087.

MUELLER AND COLLEAGUES AT THE UNIVERSITY Hospital in Basel, Switzerland, investigated the clin-

ical utility and cost-effectiveness of immediately measuring the serum level of B-type natriuretic peptide (BNP) in patients presenting to the emergency department with acute dyspnea. The clinical results of the BNP Acute Shortness of Breath Evaluation (BASEL) study, a randomized, single-blind, clinical trial of 452 patients, were published in 2004.[1] This paper presents a prospectively-identified, cost-effective analysis from that study.

Patients presenting with acute dyspnea who did not have trauma, severe renal disease, or cardiogenic shock, were randomized to have immediate measurement of BNP using a point-of-care assay or to receive conventional assessment and management without BNP measurement. The patients were generally elderly (mean age, 71 years). About half of them had known coronary artery disease, and slightly fewer had known obstructive lung disease. Heart failure was considered unlikely if the BNP level was < 100 pg/mL (36% of patients), most likely if the level was > 500 pg/mL (36%), and uncertain if the level was between 100 and 500 pg/mL (28%).

Patients in the BNP group had appropriate therapy initiated more rapidly (median time, 63 vs 90 min; P = 0.03) and were less likely to be admitted to the hospital (75% vs 85%; P = 0.008), than patients in the conventional care group. In addition, patients in the BNP group were less likely to be admitted to the ICU (15% vs 24%; P = 0.01). BNP-assigned patients had shorter hospital lengths of stay, both initially (median, 8 vs 10 days; P = 0.02) and during the 180-day observation period (10 vs 14 days; P = 0.005). The diagnosis of COPD exacerbation was made more often in the BNP group than in the control group (23% vs 11%, respectively; P = 0.001). Total initial treatment costs were less in the BNP group ($5410 vs $7264; P = 0.006), as were total treatment costs at 180 days ($7930 vs $10,503; P = 0.004). All-cause mortality initially and at 180 days (about 20%) was not different in the 2 groups.

COMMENTARY

BNP testing has become widespread in the assessment of patients with dyspnea, as well as in suspected heart failure and for following the course of patients with known heart failure. Its utility seems to be greatest when there is diagnostic uncertainty—when the patient does not have clear features of heart failure or another, non-cardiac cause for acute dyspnea.

Although the BASEL study looked only at patients presenting to the emergency department, it is tempting to assume that BNP testing would also be both clinically useful and cost-effective in evaluating hospitalized patients who develop acute dyspnea (although this has not been studied). In an editorial on BNP and cost-effectiveness analysis accompanying the paper by Mueller et al, Hlatky and Heidenreich[2] conclude by stating, "In patients with neither clear evidence of heart failure nor an extremely low suspicion of heart failure, it is reasonable to expect that BNP testing will lead to a definitive diagnosis more rapidly and will pay for itself with more efficient clinical management." Based on the findings of Mueller et al in the BASEL study, I agree. ■

References

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2. Hlatky M, Heidenreich P. The Value of BNP Testing. *Arch Intern Med*. 2006;166:1063-1064.

CME Questions

16. In urban Atlanta, which of the following organisms has recently become the most common cause of community-acquired skin- and soft-tissue infections?

a. Group A beta-hemolytic streptococcus.
b. Coagulase-negative staphylococci.
c. Methicillin-susceptible *Staphylococcus aureus* (MSSA)
d. Vancomycin-resistant *Staphylococcus aureus* (VRSA)
e. Methicillin-resistent *Staphylococcus aureus*, clone USA300 (MRSA USA300).

17. In patients with persistent ARDS, when compared to placebo, methylprednisolone led to:

a. improved survival at 180 days.
b. increased risk of infectious complications.
c. increased risk of death.
d. no significant difference in survival.
e. decreased hospital length of stay.

18. The use of BNP testing in patients presenting to the ER with acute dyspnea was recently shown by Mueller and colleagues to:

a. reduce the rate of hospital admission.
b. reduce the rate of ICU admission.
c. reduce the hospital length of stay.
d. reduce total treatment costs.
e. All of the above.

Answers: 16. (e); 17. (d); 18. (e)

CME Objectives

The objectives of *Hospital Medicine Alert* are to:

• review pertinent safety, infection control, and quality improvement practices;

• discuss diagnosis and treatment of acute illness in the hospital setting; and

• review current data on diagnostic and therapeutic modalities for common inpatient problems. ■