

HOSPITAL MEDICINE ALERT

AHC Media Home Page—www.ahcmedia.com

CME for Physicians—www.cmeweb.com

AHC Media INSIDE

The positive impact of antimicrobial stewardship programs
page 83

NSAIDs post myocardial infarction
page 84

Psychological distress decreased when families completed daily ICU diary
page 85

Stroke Alert: A review of current clinical stroke literature
page 86

Successful Decrease in Therapy Duration for Community-Acquired Pneumonia

ABSTRACT & COMMENTARY

By *Richard R. Watkins, MD, MS, FACP*

Division of Infectious Diseases, Akron General Medical Center, Akron, OH; Associate Professor of Internal Medicine, Northeast Ohio Medical University, Rootstown, OH

Dr. Watkins reports no financial relationships in this field of study.

This article originally appeared in the December 2012 issue of Infectious Disease Alert. It was edited by Stan Deresinski, MD, FACP, FIDSA, and peer reviewed by Timothy Jenkins, MD. Dr. Deresinski is Clinical Professor of Medicine, Stanford University, and Dr. Jenkins is Assistant Professor of Medicine, University of Colorado, Denver Health Medical Center. Dr. Deresinski does research for the National Institutes of Health, and is an advisory board member and consultant for Merck, and Dr. Jenkins reports no financial relationships relevant to this field of study.

Synopsis: *In this single-center, prospective study, median duration of antibiotics for community-acquired pneumonia (CAP) decreased from 10 to 7 days with an antibiotic stewardship program that included education and prospective feedback to the managing team.*

Source: Avdic E, et al. Impact of an antimicrobial stewardship intervention on shortening the duration of therapy for community-acquired pneumonia. *Clin Infect Dis* 2012;54:1581-1587.

One of the unintended consequences of the Centers for Medicare & Medicaid Services (CMS) performance measures for CAP was that clinicians often started antibiotics too quickly in patients without infection. Subsequently, the requirement that antibiotics be initiated within 6 hours of patient presentation was

EDITOR
Kenneth Steinberg, MD
Professor of Medicine, Program Director, Internal Medicine Residency Program, University of Washington

Executive Editor
Russ Underwood

Associate Managing Editor
Jill Drachenberg

Financial Disclosure:

Hospital Medicine Alert's physician editor, Kenneth P. Steinberg, MD, executive editor Russ Underwood, and associate managing editor Jill Drachenberg have no relevant financial relationship related to the material presented in this issue.

Volume 7 • Number 11 • January 2013 • Pages 81-88

NOW AVAILABLE ONLINE
WWW.AHCMEDIA.COM

retired as of Jan. 1, 2012. Another concern has been that antibiotics are continued longer than necessary. The Infectious Diseases Society of America/American Thoracic Society guidelines on CAP note that available data on short-course treatment (i.e. 5 to 7 days) do not suggest any difference in outcome compared to longer courses.¹ Overuse of antibiotics can lead to deleterious effects, including drug toxicities and *Clostridium difficile* infection (CDI).

Avdic and colleagues sought to determine if certain outcomes in CAP (decreasing duration of treatment, increasing use of microbiology to narrow therapy, and decreasing duplicate therapy within 24 hours, such as receiving two doses of a respiratory fluoroquinolone) could be improved. They conducted a single-center, prospective, pre- and post-intervention study that included all adult patients admitted to an inpatient medical service between two distinct time periods, January 1st to March 31st 2008 and February 1st to May 10, 2010. Those excluded were (1) residents of extended care facilities; (2) patients diagnosed with cystic fibrosis; (3) patients admitted to the oncology service; and (4) patients admitted for pneumonia in the preceding 30 days. After the initial observation period in 2008, a three-part intervention to improve management of CAP was undertaken. It consisted of a survey of the medical staff to assess their knowledge regarding management of CAP; an educational lecture presented to the staff that included survey results and evidence-based information about duration of therapy; and a prospective review of the management of patients with CAP by the antibiotic stewardship pharmacy specialists with oral feedback regarding suggested changes. The primary outcome measured was duration of antibiotic therapy. Second-

ary outcomes were percentage of cases where microbiology data was used to narrow therapy and percentage of patients receiving duplicate therapy.

Sixty-two patients were included in the pre-intervention period, and sixty-five in the intervention period. Patient characteristics were similar during both time frames, although there were more patients with alcohol abuse in the pre-intervention period. The median pneumonia score index (PSI) was 82 in both periods. Forty-eight stewardship interventions were made in 34 patients during the intervention period, and 69% of them were accepted by the managing team. In 2008, 21 patients (34%) had a causative organism identified, compared to 9 (14%) in 2010. This led to a change in therapy based on susceptibility testing in 3 of 16 cases (19%) in 2008 and 4 of 6 cases (67%) in 2010. Patients in the intervention group were more likely to be discharged home without antibiotics compared to the pre-intervention group (26% vs. 14%, respectively). More patients were discharged home with a respiratory quinolone in 2008 (63%) than in 2010 (35%). Furthermore, fewer patients in the intervention period received duplicate therapy within 24 hours in the intervention group (90% in 2008 vs. 55% in 2010). The median duration of therapy was decreased in the intervention group from 10 to 7 days ($P < .001$), and the most frequent duration was 8 to 10 days in the pre-intervention period and 6 to 7 days in the intervention period. There was a similar length of stay between both groups (4 days in 2008 and 5 days in 2010). Of note, the 30-day readmission rate was higher in the pre-intervention period (9 [14%] in 2008 vs. 5 [8%] in 2010). Finally, 3 patients in the pre-intervention and 1 in the intervention group developed CDI.

Hospital Medicine Alert, ISSN 1931-9037, is published monthly by AHC Media, a division of Thompson Media Group LLC, 3025 Piedmont Rd., NE, Bldg. 6, Suite 400, Atlanta, GA 30305. Website: www.ahcmedia.com.

EXECUTIVE EDITOR: Russ Underwood.
GST Registration Number: R128870672.

Periodicals Postage Paid at Atlanta, GA 30304 and at additional mailing offices.

POSTMASTER: Send address changes to *Hospital Medicine Alert*, P.O. Box 105109, Atlanta, GA 30348.

Copyright © 2013 by AHC Media. All rights reserved. No part of this newsletter may be reproduced in any form or incorporated into any information-retrieval system without the written permission of the copyright owner.

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.

This is an educational publication designed to present scientific information and opinion to health professionals, to stimulate thought, and further investigation. It does not provide advice regarding medical diagnosis or treatment for any individual case. It is not intended for use by the layman.



Subscriber Information

Customer Service: 1-800-688-2421.

Customer Service E-Mail: customerservice@ahcmedia.com

Editorial E-Mail: russ.underwood@ahcmedia.com

Subscription Prices

United States

1 year with free AMA Category 1 credits: \$249
Add \$17.95 for shipping & handling.
(Student/Resident rate: \$125)

Multiple Copies

Discounts are available for group subscriptions, multiple copies, site-licenses or electronic distribution. For pricing information, call Tria Kreutzer at 404-262-5482.

Canada

Add GST and \$30 shipping.

Elsewhere

Add \$30 shipping.

Accreditation

AHC Media is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

AHC Media designates this enduring material for a maximum of 20 *AMA PRA Category 1 Credits*SM. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

This CME activity is intended for hospitalists, intensivists, and acute care clinicians. It is in effect for 36 months from the date of the publication.

Questions & Comments

Please call Russ Underwood, Executive Editor, at (404) 262-5521 or e-mail at russ.underwood@ahcmedia.com.

■ COMMENTARY

Previous research has shown that decreasing the length of antibiotic therapy can slow development of resistance in respiratory pathogens.² In the present study, sputum cultures were rarely collected in the emergency department, and most patients received at least one dose of an antibiotic before one was obtained. This was unfortunate since negative or nondiagnostic sputum cultures often led to unnecessarily broad spectrum antibiotic therapy for longer than was clinically needed. The narrowing of antibiotics in patients with positive culture results increased by 47% in the intervention group. This finding along with shortening antibiotic duration has the potential to both decrease the emergence of resistance and minimize antibiotic adverse events.

The study was limited in several ways. First, it was conducted at a single center and had a small number of patients. Second, patients might not have taken the antibiotics they were prescribed at discharge, which could have impacted the 30-day readmission rate. Third, the intervention period occurred shortly after the H1N1 influenza pandemic, which could have affected the rates of admission

for CAP, severity of illness, type of bacterial pathogens, and the practice behaviors of the physicians. Finally, the institution had an experienced antibiotic stewardship program so the results might not be generalizable to other institutions. Although the authors comment on the rates of CDI in the pre- and intervention periods, the small number of patients (3 and 1, respectively) do not allow for the assumption of causality.

In conclusion, this study demonstrates that it is possible for antibiotic stewardship interventions to make a notable impact on the treatment of CAP. Future guidelines on CAP should continue to emphasize shorter treatment courses to minimize the ongoing threat of antibiotic resistance.

References

1. Mandell LA, et al. Infectious Diseases Society of America/ American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. *Clin Infect Dis* 2007;44(Suppl 2):S27-72.
2. Albrich WC, et al. Antibiotic selection pressure and resistance in *Streptococcus pneumoniae* and *Streptococcus pyogenes*. *Emerg Infect Dis* 2004;10:514-517. ■

The Positive Impact of Antimicrobial Stewardship Programs in Pediatrics

ABSTRACT & COMMENTARY

By Hal B. Jenson, MD, FAAP

Dean, Western Michigan University School of Medicine, Kalamazoo, Michigan

Dr. Jenson reports no financial relationships in this field of study.

This article originally appeared in the December 2012 issue of *Infectious Disease Alert*. It was edited by Stan Deresinski, MD, FACP, FIDSA, and peer reviewed by Timothy Jenkins, MD. Dr. Deresinski is Clinical Professor of Medicine, Stanford University, and Dr. Jenkins is Assistant Professor of Medicine, University of Colorado, Denver Health Medical Center. Dr. Deresinski does research for the National Institutes of Health, and is an advisory board member and consultant for Merck, and Dr. Jenkins reports no financial relationships relevant to this field of study.

Sources: Newland JG, et al. Impact of a prospective-audit-with-feedback antimicrobial stewardship program at a children's hospital. *J Pediatr Infect Dis Soc* 2012;1:179-186.

Stach LM, et al. Clinicians' attitudes towards an antimicrobial stewardship program at a children's hospital. *J Pediatr Infect Dis Soc* 2012;1:190-197.

In the first report (Newland et al), a quasi-experimental study with a control group (also known as a nonrandomized, postintervention design) was performed from 2004–2010 to determine the impact of an antimicrobial stewardship program (ASP) implemented in March 2008 in a tertiary care children's hospital that was based on prospective-audit-with-feedback. The control group included 25 children's hospitals.

A 5-step process was followed to develop the ASP. The team included an infectious disease physician, clinical pharmacist, and data analyst that worked closely with infection control, information systems, and the clinical microbiology laboratory. The clinical pharmacist documented use of broad-spectrum antimicrobials using an electronic health record system. Recommendations were communicated to the clinician caring for the child, with infectious diseases consultation for complex issues.

The team reviewed 10,460 antibiotics prescribed to 8,765 patients over the 30 months following the intervention in March 2008. The most common antibiotics reviewed included ceftriaxone, cefotaxime, ceftazidime, and vancomycin. A total of 2,378 recommendations were made in 1,703 (19%) patients, with the most common recommendation being to stop antibiotics (41%). Agreement with the recommendations occurred initially in 80% of cases, with overall compliance determined to be 92%, which did not change over time. In the intervention group, there was a strong temporal relationship between the ASP and a decline in the use of all antibiotics of 7% ($P=0.045$) in days of therapy per 1000 patient-days, and 8% ($P=0.045$) in length of therapy per 1000 patient-days. There were no increases seen in mortality or readmission rates during the study period.

In the second report (Stach et al), an electronic survey was administered to clinicians two years after the implementation to assess their attitudes toward the ASP. There were 205 of 365 participants (56%) that responded. Of these, 80% (160 of 199) had never worked with an ASP before the intervention. Respondents agreed that the ASP decreased the improper use of antibiotics (162 of 194, 84%), improved the quality of care of hospitalized children (159 of 194, 82%), and provided knowledge and education about appropriate antibiotic use (177 of 194, 91%). Adverse interpretations included a perceived loss of autonomy (22 of 194, 11%), perceived interference with clinical decision-making (12 of 194, 6%), and feeling threatened (9 of 194, 5%).

A majority of respondents (116 of 189, 61%) did not have a preference on whether the infectious disease physician or clinical pharmacist should communicate with the clinicians. However, many clinicians preferred communication from the infectious disease physician (44 of 189, 23%) or both the physician and pharmacist (29 of 189, 15%). Many clinicians (76 of 189, 40%) appreciated

face-to-face interaction for communication rather than a page. Among attending physicians, most (71 of 96, 74%) felt that it was acceptable to be informed of recommendations through residents or nurse practitioners.

■ COMMENTARY

This study documents that a prospective ASP can successfully decrease the use of broad-spectrum antibiotics in a tertiary care children's hospital. The magnitude of decrease was comparable to that observed among adult institutions.

The clinician's compliance with recommendations using this type of ASP was very high, providing insight to the potential benefit of using a prospective-audit-with-feedback over other strategies such as requiring pre-authorization. There were substantial positive feelings among clinicians with this approach, with the vast majority believing that the ASP improved the quality of care for hospitalized children. Also, the clinicians reported minimal negative impact, such as a sense of interference with clinical decision-making and threatened autonomy.

This report illustrates that the five steps to successfully implement a prospective-audit-with-feedback antibiotic stewardship program are:

- (1) developing the ASP team;
- (2) determining the stewardship strategies and antimicrobials to monitor;
- (3) establishing a method of identifying patients;
- (4) designing an evaluation of the program;
- (5) implementing the program. ■

NSAIDs Post Myocardial Infarction

ABSTRACT & COMMENTARY

By Michael H. Crawford, MD

*Professor of Medicine, Chief of Clinical Cardiology,
University of California, San Francisco*

This article originally appeared in the December 2012 issue of Clinical Cardiology Alert. It was peer reviewed by Ethan Weiss, MD, Assistant Professor of Medicine, Division of Cardiology and CVRI, University of California, San Francisco. Dr. Crawford reports no financial relationships relevant to this field of study, and Dr. Weiss is a scientific advisory board member for Bionovo.

Source: Olsen AM, et al. Long term cardiovascular risk of non-steroidal anti-inflammatory drug use according to time passed

after first-time myocardial infarction: A nationwide cohort study. *Circulation* 2012;126:1955-1963.

The use of non-steroidal anti-inflammatory drugs (NSAIDs) early after myocardial infarction (MI) has been shown to increase the risk of death or recurrent MI, but little is known about the long-term risks. Thus, this group from Denmark evaluated their national database and identified more than 99,000 patients who survived 30 days after discharge following their first MI. Of these patients, 44% filled at least one prescription for NSAIDs during a 5-year follow-up period between 1997 and 2009 when the study ended. All NSAIDs were only available by prescription, except ibuprofen. Ibuprofen was available from late 2001 on, but only in 200 mg doses with a maximum of 100 tablets. The primary outcomes were all-cause mortality and cardiac death or readmission for MI. The use of any NSAIDs was associated with an increased risk of death (HR 1.59, 95% CI, 1.49-1.69) after 1 year and HR 1.63 (CI, 1.52-1.74) after 5 years. Cardiac death or MI was also increased (HR 1.30, CI, 1.22-1.39) after 1 year and HR 1.41 (CI 1.28-1.53) after 5 years. Diclofenac exhibited the highest increase in mortality (HRs 2.07-2.73 over first 5 years). The authors concluded that the use of NSAIDs was associated with an increased risk of coronary events for more than 5 years after the first MI.

■ COMMENTARY

This population-wide observational study strongly suggests that all NSAIDs should be avoided after MI because there is a persistent increase in coronary events even after 5 years. Although naproxen exhibited the least increase in events, it has a higher likelihood of causing gastrointestinal (GI) bleeding than celecoxib, and bleeding in post-MI patients is not safe. Of course, this study does not establish causation, but there are potential mechanisms that would make the assumption of causation biologically plausible.

This is one of several cardiovascular studies to come from epidemiologists in Denmark who are mining their national databases. Such studies have the strength of large numbers, but suffer from a lack of comprehensive clinical factors that can produce unmeasured confounders. However, they believe this is unlikely because their sensitivity analysis suggests that if such a factor was present in the population at a frequency of 20%, it would have to raise the risk of mortality by about four-fold to influence the results. In fact, they repeated their analysis after excluding patients with rheumatoid arthritis and it did not change the results.

It is highly unlikely that there will ever be a randomized, controlled trial on this issue. So at this point, all NSAIDs should be avoided if possible post MI. If they do need to be used, naproxen may be the best choice unless the patient is at high risk of GI bleeding. Also, the adverse

effects of NSAIDs have been shown to be dose related, so the lowest dose for the shortest time should be used. Since most NSAIDs in the United States are available over the counter, physicians must instruct their post-MI patients about this issue. ■

Psychological Distress Decreased When Families Completed Daily ICU Diary

ABSTRACT & COMMENTARY

By Leslie A. Hoffman, RN, PhD

Department of Acute/Tertiary Care, School of Nursing, University of Pittsburgh

Leslie A. Hoffman reports no financial relationships relevant to this field of study. This article originally appeared in the December 2012 issue of *Critical Care Alert*. It was edited by David J. Pierson, MD, and peer reviewed by William Thompson, MD. Dr. Pierson is Professor Emeritus, Pulmonary and Critical Care Medicine, University of Washington, Seattle, and Dr. Thompson is Associate Professor of Medicine, University of Washington, Seattle. Drs. Pierson and Thompson report no financial relationships relevant to this field of study.

Synopsis: Family members who received a diary written during their family member's ICU admission had lower levels of symptoms related to post-traumatic stress disorder.

Source: Jones C, et al. Intensive care diaries and relatives' symptoms of posttraumatic stress disorder after critical illness: A pilot study. *Am J Crit Care* 2012;21:172-176.

Family members of patients recovering from critical illness may experience psychological problems, including anxiety, depression, and post-traumatic stress disorder (PTSD). Jones and colleagues reasoned that provision of an ICU diary, written in everyday language by ICU staff, would be beneficial to family members by providing an explanation of daily events and opportunity for expression of feelings and contribution to the plan of care. Subjects were family members of patients who were admitted to the ICU for > 72 hours and mechanically ventilated for > 24 hours. The recruitment sites were two general adult ICUs in England and Sweden. The median ICU stay for patients enrolled in the study was 14 days (range, 4-50 days).

Each patient had a diary written for them by staff while they were in the ICU and family members contributed if they wished. At discharge from the ICU, patients

and family members were randomized into two groups: one received the diary as soon as they wished but within 2 months of discharge (n = 15), and the second group at 3 months after discharge (n = 15). There were no significant differences between groups in age, length of ICU stay, hours of mechanical ventilation, or APACHE II scores. Family members completed a standardized questionnaire designed to detect PTSD symptoms 1 and 3 months following ICU discharge. At 3 months, scores reflecting PTSD symptoms were significantly lower ($P = 0.03$) in the group that received the diary within 2 months of discharge, indicating fewer PTSD symptoms.

■ COMMENTARY

This study, conducted in two European ICUs, provides interesting information regarding potential benefits of a simple intervention that may decrease psychological distress following ICU admission. The authors relate that ICU diaries are in "wide use" in Scandinavia and the United Kingdom, but the benefits of this practice have rarely been evaluated. Findings of their study are similar to those reported by a French group¹ from a study enrolling a similar-sized sample (n = 49) followed over a longer period. In the French study, scores reflecting PTSD symptoms were decreased at 12 months, but not at 3 months.

Both studies had a number of limitations: sample size was small and reported benefits did not occur until months after ICU discharge, raising the potential that intervening events were responsible for the change. Nevertheless, provision of the diary was not reported to cause any ill effects and patients and family members had the option of not reading its content. The structure of the French diary was similar to an information booklet; it included an organizational chart of the ICU with staff photos and a photo of an empty ICU bed with explanations of equipment and monitoring systems. Photos of a mechanical ventilator and other equipment were added if used. The first entry was contributed by the ICU physician who summarized the patient's medical history and condition. ICU staff contributed to the following pages by writing a daily narrative in everyday language that provided a status update. Family members contributed as they wished. At discharge, an ICU staff member wrote a conclusion expressing wishes for a good recovery. This intervention merits consideration as a means to reduce patient distress: it is simple to implement, has potential benefit, and has no apparent untoward effects. ■

Reference

1. Garrouste-Orgeas M, et al. Impact of an intensive care unit diary on psychological distress in patients and relatives. *Crit Care Med* 2012;40:2033-2040.

Cancer May Be a Risk Factor for Ischemic Stroke

STROKE ALERT

By **Matthew E. Fink, MD**

Professor and Chairman, Department of Neurology, Weill Cornell Medical College, and Neurologist-in-Chief, New York Presbyterian Hospital

Matthew Fink, MD, is a retained consultant for MAQUET.

This article originally appeared in the December 2012 issue of Neurology Alert. It was peer reviewed by M. Flint Beal, MD. Dr. Beal is Anne Parrish Titzel Professor, Department of Neurology and Neuroscience, Weill Cornell Medical Center. Dr. Beal reports no financial relationships relevant to this field of study.

Source: Schwarzbach CJ, et al. Stroke and cancer. The importance of cancer-associated hypercoagulation as a possible stroke etiology. *Stroke* 2012;43:3029-3034.

A history of cancer in a patient with ischemic stroke often raises additional concerns for the clinician, including assessment of cancer activity, as well as possible thrombophilias. The use of thrombolytic agents is also controversial in patients with active cancers. These investigators in Mannheim, Germany, attempted to assess the role of cancer-associated hypercoagulability as a risk factor for stroke by comparing a group of 140 patients with active cancer (solid tumors, excluding hematological malignancies and brain tumors) and ischemic stroke to a group of age- and sex-matched controls who had ischemic stroke without any cancer history. They collected data prospectively, including laboratory data, MRI, etiology and risk factors for stroke, types of cancer, deep vein thrombosis or pulmonary embolism, and D-dimer levels.

One hundred forty stroke/cancer patients were compared to 140 stroke controls. In the cancer patients with stroke, an unidentified cause for stroke ($P < 0.001$) and infarction in multiple vascular territories ($P < 0.001$) were more frequent, and D-dimer levels were significantly higher ($P < 0.05$) in patients with stroke and cancer. In the noncancer stroke patients, conventional risk factors, such as hypertension ($P < 0.05$) and hyperlipidemia ($P < 0.01$), were more common. Deep vein thrombosis and pulmonary embolism were more frequent ($P < 0.01$) and D-dimer levels were higher ($P < 0.01$) in cancer-associated stroke compared to controls. Lung and pancreatic cancer were significantly overrepresented and manifested higher D-dimer levels compared to patients with stroke and other types of cancer.

This study supports the concept that there is a hypercoagulable state associated with solid tumor cancers, especially in those who have an elevated D-dimer level, and that cancer may be a risk factor for ischemic stroke. The role of antithrombotic therapies in this group of patients is unknown and needs further investigation. ■

Serious Cardiac Arrhythmias May Occur During First 72 Hours After Stroke

STROKE ALERT

By **Matthew E. Fink, MD**

Professor and Chairman, Department of Neurology, Weill Cornell Medical College, and Neurologist-in-Chief, New York Presbyterian Hospital

Matthew Fink, MD, is a retained consultant for MAQUET.

This article originally appeared in the December 2012 issue of Neurology Alert. It was peer reviewed by M. Flint Beal, MD. Dr. Beal is Anne Parrish Titzel Professor, Department of Neurology and Neuroscience, Weill Cornell Medical Center. Dr. Beal reports no financial relationships relevant to this field of study.

Source: Kallmunzer B, et al. Serious cardiac arrhythmias after stroke: Incidence, time course, and predictors — a systematic, prospective analysis. *Stroke* 2012;43:2892-2897.

Investigators of the stroke arrhythmia monitoring Database in Erlangen, Germany, performed continuous telemetric cardiac rhythm monitoring on 501 acute stroke patients admitted to their stroke unit. Arrhythmias were systematically detected and categorized in a prospective fashion, and time of onset and predisposing factors were noted.

Significant cardiac arrhythmias occurred in 25.1% of all patients during the 72 hours of monitoring, with the highest risk period being the first 24 hours after admission. Serious tachyarrhythmias (ventricular or supraventricular arrhythmias > 130 beats per minute) were more frequent than bradyarrhythmias. All arrhythmias were independently associated with higher patient age and higher NIH Stroke Scale scores (more severe stroke). The risk of serious cardiac arrhythmias declines during the first 72 hours after stroke and is at highest risk during the first 24 hours. Patients with more severe strokes and advanced age are at highest risk, and continuous cardiac monitoring is strongly advised during the initial 3 days of hospitalization. ■

Can We Predict Long-Term Cognitive Impairment in Survivors of Critical Illness?

ABSTRACT & COMMENTARY

By *Linda L. Chlan, RN, PhD*

School of Nursing, University of Minnesota

Dr. Chlan reports that she receives grant/research support from the National Institutes of Health.

This article originally appeared in the December 2012 issue of Critical Care Alert. It was edited by David J. Pierson, MD, and peer reviewed by William Thompson, MD. Dr. Pierson is Professor Emeritus, Pulmonary and Critical Care Medicine, University of Washington, Seattle, and Dr. Thompson is Associate Professor of Medicine, University of Washington, Seattle. Drs. Pierson and Thompson report no financial relationships relevant to this field of study.

Synopsis: *In survivors of critical illness with documented cognitive impairment at discharge, commonly used cognitive screening tests do not predict which of these patients will experience long-term cognitive impairment.*

Source: Woon FL, et al. Predicting cognitive sequelae in survivors of critical illness with cognitive screening tests. *Am J Respir Crit Care Med* 2012; 186:333-340.

As more patients are surviving critical illness, there is documentation of serious cognitive, physical, and psychiatric consequences arising from lengthy ICU stays in these patients. Numerous studies have demonstrated new cognitive impairments in ICU survivors, yet there is no evidence available as to which patients are likely to experience long-term cognitive impairments after hospital discharge. The study by Woon and colleagues was conducted to address this knowledge gap. The researchers wanted to determine if commonly used cognitive screening tests administered at hospital discharge could be used to predict cognitive impairments, termed cognitive sequelae, 6 months later.

The baseline cognitive screening tests were the Mini-Mental State Examination (MMSE), which is the “gold standard” for cognitive status screening, and the Mini-Cog used to detect cognitive impairments; both were administered at hospital discharge. A battery of cognitive tests was administered 6 months after discharge from the hospital, including the Wide Range Achievement Test-3 Reading subtest (WRAT-3) and the Wechsler Abbreviated Scale of Intelligence (WASI). A number of neuropsychological tests were also administered 6 months after discharge to look for the presence of cognitive sequelae, including attention, upper extremity motor speed, language, memory-delayed recall, long-delay recall, mental

processing speed, and executive function. Detailed information on this extensive battery of cognitive and neuropsychological tests can be found in the article by Woon et al.

Patients receiving mechanical ventilation for > 48 hours who were 18-85 years of age were recruited from the Shock Trauma ICU and Respiratory ICU at LDS Hospital and Intermountain Medical Center in Salt Lake City, Utah, from August 2007, through December 2008. Of the 319 patients who initially met the study inclusion criteria, only 70 (50% male) participated in the cognitive assessments at hospital discharge. Of these 70 participants evaluated at hospital discharge, 10 died between discharge and the 6-month follow-up period, three declined to participate, and four were lost to follow-up contact. A final sample of 53 participants completed the 6-month follow-up, with an average age of 54 years, mean hospital length of stay of 25 days, mean ICU length of stay of 13.3 days, and mean duration of mechanical ventilation of 8.8 days.

At hospital discharge, 39% of the participants were impaired on both the MMSE and the Mini-Cog; 64% were impaired on the MMSE only with 45% impaired only on the Mini-Cog. Perhaps not surprisingly, only 28% of the patients had normal scores on both cognitive screening tests. At 6 months post-hospital discharge, controlling for pre-ICU cognitive function, education, depression, and days of mechanical ventilation, the MMSE and Mini-Cog scores were not found to predict cognitive sequelae in this sample. However, a number of the measured cognitive sequelae were found in these ICU survivors at the 6-month follow-up including, most prominently, impaired memory (38%), executive dysfunction (36%), and slow upper extremity motor speed (26%). Of note, the researchers did not assess for the presence of delirium at any time in this study.

■ COMMENTARY

The primary aim of the study by Woon and colleagues was to determine if the MMSE and the Mini-Cog could predict cognitive sequelae in survivors of prolonged critical illness. While the findings addressing the primary aim were not found to be statistically significant, the most clinically significant finding from this article is the marked cognitive sequelae in this sample of ICU survivors. Of note, this sample of study participants was relatively young (54 years of age) with impairments in memory and executive function 6 months after hospital discharge. These findings have important implications for quality-of-life outcomes in survivors of prolonged critical illness and their ability to return to work.

The small sample of only 53 participants out of an initial group of more than 300 patients limits the generalizability of these findings to ICU survivors in general. However, the marked cognitive impairments in these patients should give pause to all ICU clinicians when discussing post-ICU outcomes with patients and their family members. Surviving a prolonged critical illness may come with significant cognitive, physical, and psychiatric consequences that can directly impact quality of life. ■

CME/Objectives

Upon completion of this educational activity, participants should be able to:

- discuss pertinent safety, infection control and quality improvement practices;
- explain diagnosis and treatment of acute illness in the hospital setting; and
- discuss current data on diagnostic and therapeutic modalities for common inpatient problems. ■

CME Questions

1. In the population-based observational study by Olsen and colleagues, the use of nonsteroidal anti-inflammatory drugs (NSAIDs) after a first myocardial infarction was associated with what outcomes:

- a. An increased risk of death after 1 year but not after 5 years.
- b. An increased risk of MI after 1 year but not after 5 years.
- c. An increased risk of MI and death for at least 5 years after the first MI.
- d. A lower risk of MI but increased risk of death at 1 and 5 years.

2. Antimicrobial stewardship programs are associated with:

- a. A decrease in the use of broad-spectrum antibiotics
- b. A decrease in the duration of antibiotic treatment
- c. No increase in mortality or readmission rates
- d. All of the above

3. In the study by Jones et al. of critically ill patients, family diaries written during the ICU stay led to:

- a. An increased risk of post-traumatic stress disorder in patients
- b. A decreased risk of post-traumatic stress disorder in patients
- c. An increased risk of insomnia at 3 months after ICU discharge
- d. No significantly change in any measurable outcomes

CME Instructions

1. Read and study the activity, using the provided references for further research.

2. Log on to www.cmecity.com to take a post-test; tests can be taken after each issue or collectively at the end of the semester. *First-time users will have to register on the site using the 8-digit subscriber number printed on their mailing label, invoice, or renewal notice.*

3. Pass the online tests with a score of 100%; you will be allowed to answer the questions as many times as needed to achieve a score of 100%.

4. After successfully completing the last test of the semester, your browser will be automatically directed to the activity evaluation form, which you will submit online.

5. Once the evaluation is received, a credit letter will be sent to you. ■

To reproduce any part of this newsletter for promotional purposes, please contact:

Stephen Vance

Phone: (800) 688-2421, ext. 5511

Fax: (800) 284-3291

Email: stephen.vance@ahcmedia.com

To obtain information and pricing on group discounts, multiple copies, site-licenses, or electronic distribution please contact:

Tria Kreutzer

Phone: (800) 688-2421, ext. 5482

Fax: (800) 284-3291

Email: tria.kreutzer@ahcmedia.com

Address: AHC Media LLC

3525 Piedmont Road, Bldg. 6,
Ste. 400, Atlanta, GA 30305 USA

To reproduce any part of AHC newsletters for educational purposes, please contact:

The Copyright Clearance Center for permission

Email: info@copyright.com

Website: www.copyright.com

Phone: (978) 750-8400

Fax: (978) 646-8600

Address: Copyright Clearance Center

222 Rosewood Drive, Danvers, MA 01923 USA