



RESIDENT PRESIDENT'S MESSAGE

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President, AAEM/RSA

During my presidency, I have written a number of articles regarding a variety of topics. The common theme to all of them is that it is important as a future or present emergency medicine physician to become involved in advocacy in one form or another. This is why I initially became involved in the AAEM/RSA and why I have urged others to do so.

I recently attended AAEM's Scientific Assembly in Amelia Island. It was heartening to see how many residents and students are interested and informed regarding the preeminent issues facing the practice of emergency medicine. The importance and implications of AAEM's corporate practice of medicine litigation in Texas against TeamHealth, challenges to who can be considered board certified and the recent changes in policy of ACEP to allow non-board certified individuals to become fellows, are all issues that were discussed, among many more. There was a real passion in the debate regarding these issues. This passion is where good, strong advocacy starts.

As many of you are reading this, you most likely recently found out where you will be attending residency starting this June. I urge you to become involved outside of your residency. Our current board is comprised of four members that were serving their term as first year residents. They brought fresh ideas and enthusiasm to their positions, probably, in part, because they became involved so early in their career. In return, I believe they obtained knowledge and experience regarding the bigger picture of emergency medicine than we are often privy to when we stay within the confines of our residencies.

So, my message is simple; become involved. Become involved early. Learn as much as you can. And, pardon me for being partial, but join AAEM/RSA to achieve this. Remember, FAAEM *always* means board certified. With the exception of the founders of our specialty who became practice-eligible, board certified should ALWAYS mean emergency medicine residency trained.

Resident Journal Review: November – December 2007

This is a continuing column summarizing journal articles pertinent to EM residents. It is not meant to provide an extensive review of the articles nor is it wholly comprehensive of all the literature published. Rather, it is a short list of potentially useful literature that the busy EM resident may have missed. Residents should read the articles themselves to draw their own conclusions. This edition will include articles published over a two month period. These selections are from papers published in November and December 2007.

-David Wallace, MD MPH; Daniel Nishijima, MD; Christopher Doty, MD and Amal Mattu MD

Onalan O, Crystal E, Daoulah A, Lau C, Crystal A, Lashovsky I. Meta-analysis of magnesium therapy for the acute management of rapid atrial fibrillation. The American Journal of Cardiology 2007;99:1726-32.

This meta-analysis studied the use of magnesium sulfate for the acute management of atrial fibrillation with rapid ventricular rate. The primary outcomes analyzed were success in achieving rate control, rhythm control or both. Secondary outcomes were the time to a response and the risk of a major adverse effect. The final analysis used eight trials for rhythm control and seven trials for rate control. The total administered magnesium in trials ranged from 1.2 to 10 grams, with an initial dose of 1.2 to 5 grams given over 1 to 30 minutes.

The study design was not uniform in its comparison of magnesium sulfate therapy to placebo or standard care; however, several patterns were suggested by the Forrest plots. Magnesium was more effective than the control group for rate control (pooled OR 1.96, 95% CI 1.24 – 3.08), rhythm control (pooled OR 1.6, 95% CI 1.07 – 2.38) or either rate or rhythm control (pooled OR 4.61, 95% CI 2.67 – 7.96). Individual studies showed similar reductions in ventricular rates comparing magnesium to diltiazem or amiodarone.

This study supports further investigation into the use of magnesium sulfate for the acute management of atrial fibrillation with rapid ventricular rate. Magnesium is safe, inexpensive and widely available in emergency departments. In cases of atrial fibrillation that are difficult to control using conventional therapy, intravenous magnesium should be considered as another therapeutic option. More research is needed to explore its use as an adjunctive agent to existing pharmacotherapy, as large well-conducted trials are currently lacking.

Gupta K, Hooton TM, Roberts PL, Stamm WE. Short-course nitrofurantoin for the treatment of acute uncomplicated cystitis in women. Arch Intern Med 2007;167:2207-12.

continued on page 24



Despite its use for more than 50 years, few studies have examined a short-course of nitrofurantoin in the treatment of acute uncomplicated cystitis. This open-label study compared the efficacy of a five day course of nitrofurantoin to three days of trimethoprim-sulfamethoxazole in 338 18 to 45 year-old women. The primary outcome measure was clinical cure at 30 days; secondary outcomes were clinical and microbiologic cure at five and nine days after therapy.

The overall cure rate at 30 days was 79% for trimethoprim-sulfamethoxazole and 84% for nitrofurantoin (nonsignificant difference: -5%, 95% CI -13 to +4%). Clinical and microbiological cure rates were also equivalent at the early follow-up visits. The treatments were tolerated similarly: at least one adverse effect was reported in 41% of patients on trimethoprim-sulfamethoxazole and 39% of patients on nitrofurantoin.

This study gives promising support for another fluoroquinolone-sparing option for the treatment of acute uncomplicated cystitis. In patients who have an allergy to sulfa drugs, in practice areas with a high prevalence of trimethoprim-sulfamethoxazole resistance or when there is a high clinical suspicion of trimethoprim-sulfamethoxazole-resistant infection, a five-day course of nitrofurantoin appears to be safe and efficacious. Additionally, although this trial was not designed to evaluate the effectiveness of a three day course of nitrofurantoin, microbiologic cure was achieved in most women (98%). Further evaluation of comparable duration therapy may result in an even more attractive alternative to conventional trimethoprim-sulfamethoxazole therapy for acute uncomplicated cystitis.

de Jong YP, Uil SM, Grotjohan HP, Postma DS, Kerstjens HA, van den Berg JW. Oral or IV Prednisolone in the Treatment of COPD Exacerbations: A Randomized, Controlled, Double-blind Study. Chest 2007;132:1741-7.

The optimal route of administration of systemic steroids in acute exacerbations of chronic obstructive pulmonary disease has not been rigorously studied. This prospective, randomized, double-blind, double-dummy, placebo-controlled trial investigated the equivalency of oral and intravenous corticosteroids in patients presenting with an acute exacerbation of COPD. Treatment failure was the primary outcome.

One hundred seven patients were randomized to intravenous prednisolone; 103 patients were randomized to oral prednisolone. Treatment failure was defined as death from any cause, admission to the intensive care unit, readmission to the hospital because of COPD or the necessity to intensify pharmacologic therapy. Kaplan-Meier estimates of early and late treatment failure showed no differences between the two groups.

Oral steroids are more convenient to administer and the bioavailability of prednisolone is nearly 100% under normal circumstances. This study supports the use of oral prednisone in patients with an acute exacerbation of COPD, as

long as it is feasible and the patient is not vomiting.

Carlhom DJ, Rubenfeld GD. Barriers to implementing protocol-based sepsis resuscitation in the emergency department--results of a national survey. Critical Care Medicine 2007;35:2525-32.

Early goal-directed therapy (EGDT) in sepsis has a validated survival benefit and is supported by evidence-based guidelines. Despite evidence and support however, implementation of protocols and practice adoption is not complete. The authors describe a nationwide survey of emergency department physicians and nurses to identify perceived barriers to implementation of EGDT.

The authors conducted structured interviews with five national experts in emergency sepsis care. The responses of these participants were used to identify perceived barriers to EGDT implementation and inform the survey instrument. If respondents were not planning on developing a written EGDT protocol, they were asked three open-ended questions about their reasoning.

The authors specifically targeted large busy urban centers; the top 25 United States Census Bureau combined statistical areas were selected for sampling. In each area, the two busiest teaching and non-teaching centers were enrolled. For each site, the clinical nurse manager and the medical director of the emergency department were contacted. Responses were obtained from 64 of 200 subjects (32%), representing 53 institutions in 24 combined statistical areas.

Fourteen institutions were not using or planning an EGDT written protocol, twenty-four hospitals were currently using an EGDT protocol, and fifteen institutions were planning a written protocol. Overall, "nursing staff required to perform EGDT" was cited as the top implementation barrier 52% of the time. The study found no differences in implementation barriers identified by physicians at academic centers compared to non-academic centers.

The studies highlight that there are many perceived barriers to the adoption of EDGT. Efforts to improve adoption of written protocols will need to address these areas of concern. Furthermore, the authors showed that while some of these concerns were shared by nurses and physicians, others were not. Efforts to improve implementation of this practice will need to account for these differences in perception.

Anderson DR, Kahn SR, Rodger MA, et al. Computed tomographic pulmonary angiography vs. ventilation-perfusion lung scanning in patients with suspected pulmonary embolism: a randomized controlled trial. JAMA 2007;298:2743-53.

This study was a direct comparison of ventilation-perfusion (V/Q) scanning to computed tomographic pulmonary angiography (CTPA). The investigators conducted

continued on page 27



Resident Journal Review - continued from page 24

a randomized controlled, investigator-blinded study of 1407 patients to determine if CTPA is a reliable safe alternative to V/Q scanning in the initial noninvasive diagnostic evaluation of patients with suspected pulmonary embolism.

Patients were recruited from outpatient clinics, emergency departments and inpatient service of five academic health centers. Patients with signs or symptoms suggestive of pulmonary embolism were risk stratified using the Wells model. Those with a score of less than 4.5 and a negative D-dimer were excluded from the study. Patients with a score of more than 4.5 or those with a lower score but with positive D-dimer were randomized to either CTPA or V/Q scanning. Single-detector scans were performed in 195 patients; multidetector scans were performed in 499 patients. All CTPA studies were interpreted by an experienced chest radiologist unaware of the patient's clinical probability of pulmonary embolism.

Patients with a negative V/Q or CTPA study had anticoagulation withheld and were followed up three months later. Baseline characteristics of patients randomized to each diagnostic arm were similar. Pulmonary embolism was diagnosed in 19% of patients studied with CTPA and 14% of patients who had V/Q scanning performed. In the three month follow-up, 2 of 561 patients in the CTPA group were subsequently determined to have a pulmonary embolism, compared to 6 of 611 in the V/Q scanning group (not statistically significant; $p=0.29$).

CTPA in conjunction with clinical assessment, D-dimer testing and leg venous ultrasonography may be considered equivalent to assessment with V/Q scanning in patients with suspected pulmonary embolism. The rate of PEs at 90 days in patients with initially negative studies was not clinically or statistically significant between the two modalities.

Yanagawa Y, Sakamoto T, Okada. Hypovolemic Shock Evaluated by Sonographic Measurement of the Inferior Vena Cava During Resuscitation in Trauma Patients. J Trauma 2007; 63:1245-1248.

This prospective cohort study investigated the correlation between sonographic inferior vena cava (IVC) diameter

and recurrence of shock after fluid resuscitation in initially hypotensive trauma patients. The investigators enrolled all daytime trauma patients who arrived with a systolic blood pressure of less than 90 mm Hg. Of 488 trauma patients, 73 had shock; 30 patients were included in the final analysis.

On arrival in the emergency department, a SonoSite 180 was used to measure the maximum anterior-posterior diameter of the IVC, in the hepatic segment, in the expiratory phase. At the same time, the study patients were resuscitated according to ATLS guidelines. After the blood pressure normalized, the IVC was measured again. The clinical course of each patient was then dichotomized into transient resuscitation responders (i.e., patients who later developed a second episode of hypotension, $n=17$) and responders (i.e., patients whose hemodynamic parameters remained stable, $n=13$.) Features of the two groups were compared on arrival to the emergency department and after initial fluid resuscitation. Both change in IVC diameter and change in IVC diameter multiplied by body mass index (BMI) were discriminatory between the two groups.

The authors suggest that IVC diameter could be an independent and useful measure for evaluating the degree of hypovolemia in trauma patients. One explanation is that a high catecholamine level in these patients will mask low circulating blood volume in these patients. IVC diameter, on the other hand, appears to be less influenced by circulating catecholamines and is more closely related to circulating blood volume. In this small study, IVC diameter was a more sensitive index for predicting recurrent hypotension than blood pressure alone. This parameter shows promise as a possible target to guide resuscitation; however, more studies are needed to validate its use as such.

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