The Journal of Emergency Medicine, Vol. 57, No. 4, pp. 591–595, 2019
0736-4679/$ - see front matter

ELSEVIER

Abstracts

☐ C-REACTIVE PROTEIN TESTING TO GUIDE ANTIBIOTIC PRESCRIBING FOR COPD EXACERBATIONS.

Butler CC, Gillespie D, White P, et al. *The New England Journal of Medicine.* 2019; 381:111-20

In the United States, 6.4% of the population carries a diagnosis of chronic obstructive pulmonary disease (COPD) and it was the third leading cause of death in 2014. Approximately 75% of these patients present at least once a year to a provider for COPD exacerbation and most of these receive antibiotics. However, it is well known that antibiotics can have adverse effects and available evidence suggests that antibiotics are not always necessary for COPD exacerbation. The objective of this study was to determine if point of care (POC) CRP utilization to guide antibiotic therapy for COPD exacerbations in the primary care setting can reduce antibiotic use without harm.

The researchers conducted an open-label, randomized, controlled, multicenter trial in the United Kingdom and Wales. Eligible patients were over 40 years old and have a documented history of COPD. Researchers obtained information regarding symptom duration, medical history, physical exam findings and sputum/ throat swab collection prior to randomization. Participants completed the Clinical COPD Questionnaire and the European Quality of Life- 5 Dimensions 5-Level (EQ-5D-5L) questionnaire before being randomized as well. Subjects were randomized 1:1 to either care supplemented by point of care CRP, or standard care. Physicians taking care of patients in the CRP group used CRP in the initial and every subsequent encounter. They were given guidelines from the National Institute for Health and Care Excellence and the Global Initiative for Chronic Obstructive Lung Disease to help with interpretation of CRP results. For example, these guidelines suggested that patients with CRP levels <20mg/L would likely not benefit from antibiotics. Patients were followed up at 1 week, 2weeks, 4 weeks, and 6 months through a combination of phone calls, in-person consultation, and mailed surveys.

There were two primary outcomes for the study. The first was to determine if there was a reduction in antibiotic use in patients presenting with acute COPD exacerbation when CRP was used to direct therapy. The second was COPD-related health status at 2 weeks as measured by the Clinical COPD Questionnaire. There were a number of secondary outcomes evaluated to include the prevalence of potentially pathogenic and resistant organisms in the throat or sputum, utilization of other COPD treatments, health status as measured by the EQ-5D-5L, and antibiotic prescribing and use for any cause during the first 4 weeks of follow-up.

Of the 653 patients who were randomized, 325 were assigned to the CRP guided group and 324 were assigned to the usual care group (3 patients withdrew consent and 1 patient with incorrect randomization had their data destroyed). Baseline characteristics were similar between the two groups. The percentage of patients with antibiotic use was lower in the CRP group (57% vs 77.4%) with an adjusted odds ratio of 0.31 (95% CI: 0.20-0.47). Regarding clinical outcomes, the difference in the Clinical COPD Questionnaire score was -0.19 points (two sided 90% CI: -0.33 to -0.05) favoring the CRP group. Secondary measures such as pathogen type, utilization of other treatments, and other quality of life scores did not show any difference between the two groups.

The authors concluded that using point of care CRP to determine the need for antibiotic treatment in patients presenting with COPD exacerbations by led to fewer antibiotic prescriptions and reported antibiotic use without any evidence of harm to the patients.

[Alisa Fujihashi, MD
Jerrilyn Jones, MD, MPH
University of Arkansas for Medical Sciences, Little Rock, AR]

Comment: While this study shows promise in potentially curbing unnecessary antibiotic use in patients presenting with COPD exacerbations, we cannot yet recommend directly applying these data to emergency department patients in the US. Patients often self-select to present to the emergency department, rather than their primary care physician, which could possibly indicate higher acuity or likelihood of needing antibiotics. Additionally, study subjects were not blinded to having received the point-of-care test. Future studies involving the use of CRP in emergency department COPD patients would be useful in determining whether or not practice patterns should change in this specific population.

☐ THE EFFECT OF HEMORRHAGE CONTROL ADJUNCTS ON OUTCOME IN SEVERE PELVIC FRACTURE: A MULTI-INSTITUTIONAL STUDY.

Duchesne J, Costantini T, Khan M, et al. *J Trauma Acute Care Surg*. 2019; 87: 117-124

Pelvic fractures complicated by hemorrhagic shock continue to be a significant challenge to trauma surgeons with a mortality rate up to 30%. The initial hemorrhage control interventions applied to these patients varies between trauma centers and thus there is a lack of consensus regarding the best method to control hemorrhage and their effects on patient outcomes. The

goal of this study was to determine which initial hemorrhage control intervention is most effective with respect to bleeding control and decreased mortality in patients with severe pelvic fractures.

This was a multi-institutional retrospective database review in which 12 trauma centers participated. Patients included in the study had a diagnosis of pelvic fracture and were 18 years or older. They also had to have a systolic blood pressure of 90 mmHg or less, a heart rate greater than 120 beats per minute at admission, or a base deficit >5. Patients were excluded if they were pregnant, had an isolated hip fracture, or had a penetrating mechanism of injury. Adjuncts for hemorrhage control included pelvic binder, external fixator, pre-peritoneal packing (PPP), and resuscitative balloon occlusion of the aorta (REBOA). The primary outcome was the frequency of each type of adjunctive hemorrhage intervention used, the time until definitive bleeding control was established (either in the operating room or by interventional radiology for angioembolism) and the mortality within each group. The secondary outcome was the prevalence of transfusion requirements within 24 hours of admission as it relates to the associated adjunct hemorrhage intervention used. A subgroup analysis of patients based on injury severity scores (ISS) was performed, with patients grouped into lower severity (ISS < 25) or higher severity (ISS $\geq$ 25) injuries. Multivariable regression was also performed to identify independent predictors of mortality.

This study included 279 patients from twelve trauma centers, admitted between January 2011 and December 2016. The majority of patients were male (62%), white (55%), with a median age of 40, and an median ISS of 38. The overall mortality was 32% and 96% of those deaths occurred in patients with an injury severity score of over 25. The most common hemorrhage control adjunct used was pelvic binder (50%) followed by no adjunct (35%). The least common adjunct used was REBOA (2.5%). Use of pelvic binding and/or external fixator resulted in the lowest mortality rate. Patients who received both REBOA and PPP required the largest blood transfusions. REBOA alone or with adjuncts and PPP alone resulted in shorter time to definitive bleeding control. The highest incidence of death was seen in the REBOA and pre-peritoneal packing groups. Regression indicated that the following variables were predictive of death: age (OR 1.031; 95% CI 1.006-1.056), initial GCS of 3-8 (OR 2.899; 95% CI 1.200-7.005), and number of transfused PRBC units in the first 24 hours (OR 1.035; 95% CI 1.007-1.060).

The authors note that the variation in management of patients with pelvic fractures complicated by hemorrhagic highlights the lack of consensus on the best modality to treat and the need for a standardized approach. Pelvic binders play an important role in preserving volume in venous bleeding and should be first line. If hemorrhage is not controlled with a pelvic binder, the source is likely arterial and thus the authors suggest that REBOA should be the next preservation adjunct. The authors also mention that REBOA is underutilized and understudied and thus further studies are indicated to validate REBOA as a second line adjunct.

[Bethany Dalby, DO
Jerrilyn Jones, MD, MPH
University of Arkansas for Medical Sciences, Little Rock, AR]

Comments: This study suggests that pelvic binding plays an important role in initial hemorrhage control for pelvic fractures. This is an easily performed adjunct for emergency physicians regardless of location or resources. REBOA is suggested as the next step in bleeding control in patients who do not respond adequately to pelvic binders, however the available data for REBOA is conflicting and this is often not available in outlying hospitals. Further analysis and validation of REBOA in decreasing mortality in patients with pelvic fractures complicated by hemorrhagic shock is warranted.

☐ TRANEXAMIC ACID ADMINISTRATION FOLLOWING HEAD TRAUMA IN A COMBAT SETTING: DOES TRANEXAMIC ACID RESULT IN IMPROVED NEUROLOGIC OUTCOMES?

Morte D, Lammers D, Bingham J, et al. *Journal of Trauma and Acute Care Surgery.* 2019;87:125-129

Research shows that administration of tranexamic acid (TXA) in severely injured trauma patients can decrease mortality as well as the amount of blood products required. Morbidity and mortality is high for patients with traumatic brain injuries (TBIs). The theory is that progressive of intracranial bleeding, cerebral edema and cerebral ischemia may contribute to the poor outcomes for TBI patients. There have been studies looking at the progression of intracranial bleeding in patients with TBIs after receiving TXA, however these studies have not thoroughly evaluated the effect on clinical outcomes. The goal of this study was to compare neurological outcomes in adult trauma patients who received TXA versus those who did not receive TXA.

This study retrospectively reviewed the Joint Theater Trauma Registry of all adult patients treated after trauma at forward role 2 and higher medical treatment facilities in Iraq and Afghanistan from 2008 to 2015. Patients with a recorded Head Abbreviated Injury Scale (AIS) were included; patients without a Head AIS documented and patients without head injuries were excluded. Patients were given TXA if clinically indicated based on Combat Casualty Care Data guidelines with standardized dosing of 1 gram intravenously in the first 3 hours after injury followed by additional 1 gram dose infused over the next 8 hours. The indications for giving TXA included patients requiring resuscitation with blood products after combat-related hemorrhage or patients likely to require massive transfusion protocol (greater than 10 units of blood products over 24 hours). Propensity score matching was used to create two groups, the TXA group and the no-TXA group, with no statistically significant differences in age, sex, mechanism of injury, Injury Severity Score (ISS), anatomic AIS, vital signs, initial Glasgow Coma Scale (GCS), laboratory values, early transfusion requirements, total transfusion requirements, neurosurgical interventions, and emergent operations. Primary outcomes included severity of TBI at discharge (based on GCS; mild: 14-15, moderate: 9-13, severe 3-8), GCS score at discharge compared to initial presentation, and in-hospital mortality. Secondary outcomes looked at the incidence of respiratory failure and the rate of thromboembolic events.