



Resident Journal Review: November - December 2008

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This is a continuing column providing journal articles pertinent to EM residents. It is not meant to be 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 July and August 2008.

Deitch K, Chudnofsky CR, Dominici P. The utility of supplemental oxygen during emergency department procedural sedation with propofol: a randomized, controlled trial. *Ann Emerg Med.* 2008 Jul;52(1):1-8

This prospective, controlled, randomized study attempted to determine whether the use of supplemental oxygen during procedural sedation with propofol would reduce the incidence of hypoxia by 20% (calculated based on previous studies). In addition, the investigators blinded the clinical staff to capnography information to assess whether oxygen administration interferes with the recognition of respiratory depression. Respiratory depression was defined as oxygen saturation $\leq 93\%$, end tidal CO₂ (ETCO₂) level ≥ 50 mm Hg, absolute ETCO₂ change from baseline ≥ 10 mm Hg, or loss of the ETCO₂ waveform.

110 adult patients were analyzed, 56 of which received supplemental oxygen and 54 of which were placed on compressed air. Ten (18%) patients in the supplemental oxygen group and 15 (28%) patients in the compressed air group experienced hypoxia. The authors calculated a difference of 10%, which was not statistically significant. Additionally, 27 of 110 (24.5%) study patients met one or more ETCO₂ criteria for respiratory depression but did not experience hypoxia; twenty of these patients received supplemental oxygen, seven received compressed air. Nine patients had ETCO₂ changes suggestive of respiratory depression prior to the onset of hypoxia (three received supplemental oxygen, six room air).

The authors' conclusions suggest that low-flow oxygen may have little impact on hypoxia during sedation with propofol. However, a trend toward reduction of hypoxia was noted. What remains to be determined is whether high-flow oxygenation or preoxygenation to 100% would decrease the incidence of hypoxia. Furthermore, their data also suggests that capnography should play a greater role in monitoring patients for respiratory depression.

Gray A, Goodacre S, Newby DE, Masson M, Sampson F, Nicholl J. Noninvasive ventilation in acute cardiogenic pulmonary edema. *N Engl J Med.* 2008 Jul 10;359(2):142-51

Noninvasive ventilation has become the standard of care for the management of acute pulmonary edema. Prior studies have indicated that noninvasive positive pressure ventilation reduces mortality, the rate of endotracheal intubation and intensive care unit length of stay. This multicenter study randomized 1156 emergency department patients with acute pulmonary edema to one of three treatments: standard oxygen therapy, continuous positive airway pressure (CPAP) or noninvasive intermittent positive pressure ventilation (NIPPV). Patients received standard medical therapy with nitrates, diuretics and/or opioids and received supplemental oxygenation to achieve a saturation above 92%. The trial protocol allowed further use of CPAP, NIPPV or intubation at the discretion of the treating clinician. The main outcome measured was death within seven days

of treatment. The study also looked at rates of intubation within seven days, subjective reports of dyspnea, length of hospital stay, admission to a critical care unit and 30 day mortality.

The authors reported no significant difference in the primary end point of seven day mortality between patients receiving noninvasive ventilation (CPAP or NIPPV) (9.5%) and those receiving standard oxygen therapy (9.8%). There was no significant difference in the rates of intubation, 30-day mortality, admission to the critical care unit, or myocardial infarction. Noninvasive ventilation (CPAP or NIPPV) was associated with greater reductions in dyspnea, heart rate, acidosis and hypercapnia than was standard oxygen therapy.

While the conclusions of this study seem to indicate that noninvasive ventilation did not decrease mortality or intubation compared with standard oxygen therapy, closer analysis of the results of this study show that 56 out of 363 patients started on standard oxygen treatment were switched to a form of noninvasive ventilation (43 to CPAP, 13 to NIPPV) during the study protocol. It is difficult to draw conclusions from the study results when over 15% of patients in the control group are given the experimental intervention.

Suberviola B, González-Castro A, Llorca J, Ortiz-Melón F, Miñambres E. Early complications of high-dose methylprednisolone in acute spinal cord injury patients. *Injury.* 2008 Jul;39(7):748-52

Recent literature in the field of spinal cord injury (SCI) suggests that the use of high-dose steroids may not be beneficial, and in fact, may be harmful due to infectious and metabolic complications. The authors of this retrospective study sought to review the outcomes of patients admitted to their hospital with SCI with regard to rates of infection and degree of neurologic improvement.

Over a ten year span, 59 patients received methylprednisolone according to the NASCIS II protocol, and 23 patients with SCI received no steroids. The rate of respiratory tract infections was significantly higher in the methylprednisolone group, as was the incidence of hyperglycemia. There was no significant difference in the rates of neurologic recovery between the two groups. Although the group of patients who did not receive methylprednisolone had a higher average injury severity score (ISS), there was no significant difference in the mortality rate between the two groups. This data adds to the growing body of evidence that the harm of giving high-dose steroids may outweigh the benefits in acute spinal cord injury.

Birnbaum A, Esses D, Bijur P, Wollowitz A, Gallagher EJ. Failure to validate the San Francisco Syncope Rule in an independent emergency department population. *Annals of Emergency Medicine* 2008;52:151-9

The San Francisco Syncope Rule (SFSR) is a clinical decision rule to help identify patients who are at low risk of seven day adverse

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events following a syncopal episode. The original validation cohort was 96% sensitive for unfavorable outcomes, supporting its use in disposition decisions. Since the original study was published, groups have tried to validate the rule in other patient populations. This cohort study evaluated the SFSR in 713 patients evaluated for syncope or near-syncope in a Bronx, New York hospital. Disposition was left to the treating emergency medicine attending, with predictor and outcome data independently collected for all patients. Performance characteristics were calculated.

In this cohort of patients, the sensitivity of the SFSR was 74% for detecting short-term adverse outcomes.

Clinical decision rules attempt to reduce the uncertainty of medical decision-making and inform management or disposition decisions. The results of this study suggest that the SFSR is insufficiently sensitive to identify patients at low-risk of serious short-term outcomes, and therefore cannot safely be applied for decisions about disposition in patients presenting to the emergency department with syncope.

Fitch RW, Kuhn JE. Intraarticular Lidocaine versus Intravenous Procedural Sedation with Narcotics and Benzodiazepines for Reduction of the Dislocated Shoulder: A Systematic Review. Acad Emerg Med 2008;15:703-8

Intravenous procedural sedation is standard in most emergency departments for the reduction of anterior shoulder dislocations. The authors conducted a systematic review for various outcomes following use of intraarticular lidocaine (IAL) and intravenous sedation (IVS).

Six prospective randomized controlled trials were identified. Data on complications, pain level perceived by the patient, ease of reduction, total time for reduction and emergency department length of stay were extracted. The primary outcomes of interest were reduction success rate, pain, ease of reduction, time of reduction and complications. Compiling the data resulted in an 89.9% reduction success rate for IAL and 95.6% reduction success rate for IVS. Pain perception and ease of reduction were the same in both groups. When reported, length of stay was consistently lower in the IAL studies (78 minutes and 75 minutes compared to 186 minutes and 185 minutes), as were complication rates (0.67% compared to 13.3%).

This systematic review showed equivalent reduction success rates for IAL compared to IVS and significantly reduced length of stays and complication rates in the former. This suggests that use of IAL for the reduction of anterior shoulder dislocations will result in improved through-put times, lower complication rates and similar reduction success and pain perception. These findings argue strongly for emergency medicine practitioners to consider incorporating this technique into their management of anterior shoulder dislocations.

Vestergaard M, Pedersen MG, Ostergaard JR, Pedersen CB, Olsen J, Christensen J. Death in children with febrile seizures: a population-based cohort study. Lancet 2008;372:457-63

This large Danish cohort study identified nearly 1.7 million children to better estimate mortality after febrile seizures. The investigators linked information from national health and death registers and followed the patients for an average of 13 years. This represented 23.1 million person-years of follow-up.

232 deaths were identified in 55,215 children with a history of febrile seizures. The mortality rate ratio between children with a history of febrile seizure and those without was 80% higher during the first year after the first febrile seizure. During the second year it was 90% higher. This ratio was unchanged by restricting the group to patients with birth weight more than 2,500 grams, gestational age at birth more than 36 weeks, an Apgar score of 10 at 5 minutes and no gestational malformations. After the second year, the mortality rate was the same for patients with a history of febrile seizures and those without. For all-comers, 132 per 100,000 children died within the first two years of following a febrile seizure, compared to 67 per 100,000 for children without that history. Yet, when analyzed by type of seizure, children with simple febrile seizures had a mortality rate that was similar to the background population.

Death after febrile seizures is very rare, even in high-risk children. For simple febrile seizures, there is no increase in mortality; for complex partial seizures there is a small excess mortality in the first two years following the event. Emergency medicine practitioners can reassure parents that adverse events are uncommon following febrile seizures, and for non-complex partial seizures, there is no apparent additional mortality burden.

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