LO014

What ultrasonography characteristics predict surgical intervention for testicular torsion in adults?

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Introduction: Testicular torsion is a time sensitive condition for which there can be significant delays to surgery or transfer to definitive care while trying to obtain an ultrasound to confirm the diagnosis. This study determines the test characteristics for each individual sonographic sign of testicular torsion associated with the patient requiring surgical intervention. **Methods:** A retrospective health records review of adult patients with acute, non-traumatic scrotal pain or swelling (defined as under 24 hours since onset) presenting to one of two Canadian academic tertiary care emergency departments between November 2009 and March 2013 was performed. A single data abstractor completed a case report form for each patient including demographics, individual ultrasound findings, final diagnosis, and need for surgical intervention. The sensitivity and specificity of each ultrasonographic sign (including testicular heterogeneity, decreased colour doppler, and decreased pulsed wave doppler) at predicting surgical intervention during the same hospital visit was calculated along with 95% confidence intervals. **Results:** During the study period there were a total of 876 emergency department visits for scrotal pain, of which 198 patients met our inclusion criteria. The included patients had a mean age of 36.2 years. Decreased blood flow to the painful testicle on colour doppler showed the best overall test characteristics with a sensitivity of 82.4% (95% CI 55.8%-95.3%) and specificity of 100% (95% CI 96.3%-100%) for predicting a need for surgical intervention for testicular torsion. Other ultrasound findings for testicular torsion included a heterogeneous appearance of the painful testicle (sensitivity 47.1% [95% CI 23.9%-71.5%], specificity 77.4% [95% CI 68.9%-84.2%]), and decreased arterial or venous flow on pulsed wave doppler (sensitivity 76.5% [95% CI 49.8%-92.1%], specificity 100% [95% CI 96.3%-100%]). **Conclusion:** Decreased blood flow to the painful testicle on colour doppler showed excellent specificity and can rapidly "rule-in" a need for surgical intervention for testicular torsion. Given that colour doppler is relatively easy to learn and perform, future studies should assess the use of colour doppler using point of care ultrasound to expedite surgical consultation.

Keywords: testicular torsion, point-of-care ultrasound (PoCUS), ultrasound

LO015

A multi-centered regional emergency department study of renal colic management using medical expulsion therapy

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Introduction: Patients with renal colic present frequently to the emergency department (ED). Existing literature suggests management with medical expulsion therapy (MET) may improve outcomes, especially for those with stones > 5 mm in size. This study evaluates the use of MET in the management of adult patients seen in regional EDs with a diagnosis of renal colic. **Methods:** A multi-centered medical chart review study was conducted in seven Edmonton-Zone EDs. Approximately 100 cases from each site were randomly selected from administrative data from the 2014 calendar year, no repeat cases were permitted. Using a standardized data collection process and trained research assistance, data were abstracted from medical charts. Medians and inter-quartile ranges (IQR), proportions, and odds ratios (OR) with 95% confidence intervals (CIs) are reported. **Results:** Overall, 656 patient charts were included in the review; median age was 46 years (IQR: 35, 46) and 249 (38%) were female. Few (10%) arrived by ambulance or were on MET therapy at presentation; however, many (51%) reported a previous episode of renal colic. Many (191 {29%}) received no initial ED imaging; CT (236 {36%}) was favoured over ultrasound (39 {6%}) for initial imaging, either alone or with plain radiographs (8%). Plain radiographs were frequently ordered (204 {31%}). Only 198 (31%) of charts contained documentation of the use of MET at discharge and the median duration of therapy was 10 days (IQR: 7, 14). Initiation of MET therapy did not vary based on older age (OR = 0.8; 95% CI: 0.57, 1.14); sex (OR = 0.9; 95% CI: 0.67, 1.33); resident involvement (OR = 1.1; 95% CI: 0.63, 2.0); presentation to an academic centre (OR = 1.4; 95% CI: 0.96, 1.95) or stone size (OR = 1.3; 95% CI: 0.76, 2.06). **Conclusion:** Management of renal colic with MET is uncommon in this region and practice variation appears driven by physician preference rather than evidence. Practice guidelines with standardized order sets are urgently needed to improve care.

Keywords: renal colic, medical expulsion therapy, emergency department

LO016

Can we use administrative data to define an emergency department population at risk for pulmonary embolism? Development and validation of an algorithm to identify a research population

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Introduction: Pulmonary embolism (PE) is a potentially life-threatening condition that is in the differential diagnosis of many emergency department (ED) presentations. However, no diagnostic code for *suspected PE* exists. Thus, identifying the population of patients undergoing PE workup from administrative data for use as a denominator in clinical research and quality improvement can be difficult. To overcome this, we used standardized triage complaint codes and investigations to develop search algorithms useful to identify patients undergoing PE workup from an administrative dataset. Our objective was to quantify the sensitivity, specificity, and case yield of these search algorithms in order to identify a superior search strategy. **Methods:** Hospital administrative data for adult patients (age $\geq$18 years), which included standardized triage complaint codes and ICD-10 diagnostic codes for PE, were obtained from four urban EDs between July 2013 to January 2015. Standardized triage complaint codes were evaluated for the proportion of patients diagnosed with PE. Combinations of high-yield presenting complaints, in combination with D-dimer testing or imaging orders, were evaluated for sensitivity, specificity, and predictive values for PE. **Results:** Of 479,937 patients presenting with 174 different complaints, 1,048 were diagnosed with PE. The best-performing search strategy was the combination of standardized CEDIS complaints of Cardiac Pain, Chest Pain (Cardiac Features), Chest Pain (Non-Cardiac Features), Shortness of Breath, Syncope/Pre-syncope, Hemoptysis, and Unilateral Swollen Limb/Pain, along with with D-dimer testing and/or CTPA, or V/Q scan. This combination captured 808 PE diagnoses for a sensitivity of 77.1% (95%CI 74.4-79.5%) and specificity of 86.8% (95%CI 86.7-86.6%). **Conclusion:** We identified a high-yield combination of presenting complaints and test ordering that can be used to define an ED population with suspected PE. This population of patients can be used as a denominator in research or quality improvement work that evaluates the utilization of diagnostic testing for PE.

Keywords: pulmonary embolism

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