Correlation of Clinical Parameters with Results of Unenhanced Renal Colic CT in the Emergency Department Setting

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No Disclosures
INTRODUCTION

• Unenhanced CT (CT-KUB) has become investigation of choice for patients presenting with renal colic in the emergency department (ED)

• Advantages of CT-KUB
  – Fast, easily available
  – Able to visualize uric acid stones (radiolucent on xray)
  – Anatomic localization for planning ESWL, PCNL
  – May show alternate cause of symptoms
INTRODUCTION

• Disadvantages
  – Ionizing radiation (estimate 8.5 mSv per scan)
  – Potentially not cost-effective

• Significant trend of increasing usage...
  – Hyams et al estimated usage in US increased from 19.6% to 45.5% between 2000 and 2008.

• ...however, not associated with increased rate of diagnosis of stone disease
  – 21.9% in 2000 and 22.9% in 2008
INTRODUCTION

• Potential role of clinical predictors for stratifying patients who could possibly be treated for presumed stone disease without a CT-KUB

• Study Rationale:
  – To retrospectively determine if specific clinical parameters in patients undergoing CT-KUB for suspected renal colic are predictive of a positive CT finding of a corresponding obstructing urinary tract calculus.
MATERIAL AND METHODS

Population: 438 patients who underwent CT-KUB after presenting to ED with suspected renal colic
Randomly selected, between Oct 2009 and Jan 2012

Patient charts reviewed and the following recorded:
Gender, pain location and severity, time of onset to presentation, prior history of stones, irritative urinary symptoms (frequency, urgency, dysuria), fever, WBC, urine nitrites, pyuria, hematuria

CT reports reviewed for:
Presence or absence of corresponding symptomatic urinary tract calculus
Presence of alternative diagnosis

Multivariable logistic regression performed
RESULTS

• 59.6% of patients had positive finding CT-KUB

• Statistically significant association with:
  – male gender (odds ratio, OR 2.76, p<0.05)
  – time of onset less than 24hr to presentation (OR 1.95)
  – hematuria (OR 3.32)

• Using model including these three factors yielded 68.9% accuracy in predicting positive CT-KUB

• Alternate diagnosis was found in 4%
  – Cholecystitis (2), diverticulitis/colitis (4), appendicitis (1), ileitis (1), epiploic appendicitis (3), pancreatitis (1)
  – Only 2% acute findings or requiring follow-up
DISCUSSION

• Findings suggest that a combination of clinical symptoms and laboratory results may be useful to triage patients for imaging

• Acutely important alternate diagnoses found in only 2%

• In a high probability scenarios (ie. suspected renal colic in male with hematuria, time of onset <24hr to presentation) and in absence of infectious symptoms, may be safe to treat empirically without CT
  – known male predilection for stones (3:1 M:F)
  – Female patients also more likely to get ultrasound as first line imaging for abdominal pain
  – Hematuria alone has been previously shown to be sensitive but not specific for stone disease
DISCUSSION

• Study Limitations
  – Retrospective study
  – Charting sometimes inconsistent (missing or conflicting information)
  – Indication written on requisition may not be reflective of clinical suspicion
  – No long term follow-up
CONCLUSION

• Three specific clinical variables (male gender, presence of hematuria, and time of onset of pain to presentation <24hr) predict positive CT-KUB

• Results could form basis for developing a clinical prediction rule

• Though does not completely obviate the need for CT, in high probability clinical scenarios where radiation/cost effectiveness a concern ctkub may not be necessary

• Future directions include validation in other centers, prospective studies, potential impact on clinical outcome and cost analysis
REFERENCES

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