

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 appendigitis (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

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