

SS Goonewardene^{1*} and P Rajjayabun²¹Urology Registrar Great Western Hospitals, Swindon, England²Consultant Urological Surgeon Worcester Acute Hospitals, Worcestershire, England**Dates:** Received: 08 September, 2015; Accepted: 29 January, 2016; **Published:** 01 February, 2016***Corresponding author:** SS Goonewardene, Urology Registrar Great Western Hospitals, Swindon, England, E-mail: ssg7727@yahoo.co.ukwww.peertechz.com

ISSN: 2455-5495

Research Article

Acute Management of Renal Colic and Compliance with National Standards: Closure of the Audit Loop

Opiates. If stones are present, mandatory metabolic studies must be conducted. Renal drainage is required in the presence of sepsis/ an infected obstructed kidney, a single functioning kidney or intractable pain.

Introduction

Renal (ureteric) colic is a common surgical emergency. It is usually caused by calculi obstructing the ureter, but about 15% of patients have other causes, e.g. extrinsic compression, intramural neoplasia or an anatomical abnormality [1]. Up to 12 percent of the population will have a urinary stone during their lifetime, and recurrence rates approach 50 percent [2]. Fifty-five percent of those with recurrent stones have a family history of urolithiasis [3] and having such a history increases the risk of stones by a factor of three [4]. Upon presentation to the A&E department, suspected acute renal colic patients must have a clinical examination and radiological investigations to confirm the diagnosis [5].

The best imaging study to confirm the diagnosis of a urinary stone in a patient with acute flank pain is unenhanced, helical CT of the abdomen and pelvis [6]. If CT is unavailable, plain abdominal radiography should be performed, since 75 to 90 percent of urinary calculi are radiopaque [5]. Although ultrasonography has high specificity (greater than 90 percent), its sensitivity is much lower than that of CT, typically in the range of 11 to 24 percent [5]. Thus, ultrasonography is not used routinely but is appropriate as the initial imaging test when colic occurs during pregnancy [7]. Urgent intervention is indicated in a patient with an obstructed, infected upper urinary tract, impending renal deterioration, intractable pain or vomiting, anuria, or high-grade obstruction of a solitary or transplanted kidney [5]. Infection proximal to obstruction is suggested by fever, urinalysis showing pyuria and bacteriuria, and leukocytosis, and the presence of urosepsis is associated with an increased risk of complications [5]. Impaired glomerular filtration inhibits the entry of antibiotics into the collecting system and requires emergency decompression by means of either percutaneous nephrostomy or ureteral stenting [8,9].

There are very strict guidelines produced by the BAUS and the College of Emergency Medicine. Despite this, over a quarter of UK A&E departments did not perform any radiological investigations when patients presented with renal colic. Shockingly some departments do not even offer renal colic patients any analgesia [5].

British Association of Urology Guidelines (2008) [10], specify clinical assessment must exclude UTI/ AAA. Initial investigations must include x-ray KUB, urinalysis and FBC/U+Es. Within 24 hours a Non contrast CT must be conducted to confirm the diagnosis, or IVU if CT is unavailable. In addition analgesia must be administered: NSAIDS/

We previously audited our patient records, and demonstrated we were none compliant with the recommended gold standards. We analysed 32 case notes, from Dec 2009 to September 2010 admitted with a provisional diagnosis of renal colic to Worcestershire Acute Hospitals. We demonstrated the mean time to analgesia from triage for severe pain was 106 minutes, 62 minutes for moderate pain and 46 minutes for mild pain. 84% received the appropriate analgesic (NSAID/Opiate). The reasons for not giving analgesia were documented in all cases. In only 18% (6 cases) pain was re-evaluated within 60 minutes. Stones were proven in 15% (5 cases). 100% of cases had urinalysis (results recorded in the notes). With appropriate bloods being taken in 93.9% (31 cases, FBC, U+Es), but only 2 patients (6%) had Urata and calcium levels taken. 75.8% (25 cases) had X-ray KUBs done as the initial radiological intervention, 78.1% (23 cases) being done the same day. 53.1% (17 cases) had a NCCT, 15% (5) being done within 24 hrs. 9% (3 patients) had IVU conducted, one within 24 hrs. 2 as an outpatient. 29 patients had a radiology plan in the notes. 5 patients had neither X-ray KUB nor NCCT.

Since then, interventions including teaching sessions to junior doctors by a Consultant Urologist have been put into place to improve clinical practice.

Aims and objectives

We aim to re-audit management of patients admitted to Worcestershire Acute Hospitals with renal colic in line with BAUS guidelines (2008) over a one year period and develop recommendations in order to develop the service further.

Method

Over one year, we conducted a retrospective analysis of patient notes admitted with renal colic to Worcestershire Acute Hospitals. We will be collecting data on the following in order to see if clinical practice was in line with guidelines:

- Recording of pain score
- Whether patients in pain were offered/ received appropriate analgesia within 60 minutes of arrival/ triage
- Patients with pain having documented evidence of re-

evaluation and action within 60 minutes of receiving the first dose of analgesic

- History / Examination: to exclude Abdominal Aortic Aneurysm, UTI.
- Initial Investigations
 - o Patients should have a dipstick urinalysis performed and the result recorded in the notes
 - o Patients should have FBC & renal function performed and the result recorded in the notes before discharge
 - o Serum Calcium / Urate: Mandatory basic metabolic studies if stones are present.
 - o X-ray KUB, non-contrast CT or IVU documented in notes and whether CT was conducted within 24 hrs.
 - o Patients over 60 should have AAA excluded by appropriate investigation
- Outpatient review, GP follow up or specialty referral should be made in accordance with local policy.
- Renal Drainage: Required in presence of: Sepsis / infected obstructed kidney.
- (Nephrostomy / Stent) Single functioning kidney. Intractable pain.
- Emergency Senior Urological referral to determine if disobstruction required and method / timing of renal drainage.

Results will be analyzed via percentages and compared to previous audit to close the audit loop.

Results

40 cases were admitted to Worcestershire Acute Hospitals with a diagnosis of renal colic. One patient declined analgesia (results documented in notes). 25% had severe pain (10 cases, pain score 7-10), time to analgesia 30 minutes. 25% had moderate pain (10 cases, score 4-6), time to analgesia was 40.4 mins. 50% had mild pain score (20 cases, pain score 1-5), time to analgesia 81.8 mins. 72.5% (29 patients) had their pain re-assessed within one hour after receiving analgesia. 77.5% (31 patients) received appropriate analgesia (NSAID/ Opiate). 45% (18 patients) had clinical history/ examination to rule out UTI/ AAA. 100% of patients had urinalysis, but in 2 cases, results were not documented in notes. 65% (21 cases) had X-ray KUB as the initial investigation, 79% the same day, 9 cases then had NCCT. 75% (30 cases) had NCCT, 50% (15 cases) were the same day. 27.5% (11 cases) had stones on CT. One case had an OP IVU. The Radiology plan was documented in notes in 92.5% (37 cases). 100% had blood for FBC and U+ES which were all documented in notes. Only 3 cases had urate and calcium levels tested. 100% of cases had senior Urology review.

We analyzed 32 case notes, from Dec 2009 to September 2010 admitted with a provisional diagnosis of renal colic to Worcestershire Acute Hospitals. We demonstrated the mean time to analgesia from triage for severe pain was 106 minutes, 62 minutes for moderate pain and 46 minutes for mild pain. 84% received the appropriate analgesic (NSAID/Opiate). The reasons for not giving analgesia were documented in all cases. In only 18% (6 cases) pain was re-evaluated

Table 1: Table comparing both cohorts.

	Cohort 1 with ureteric colic	Cohort 2- post teaching and education
Patients	32 patients	40 cases
Dates	Dec 2009 to September 2010	October 2010- July 2010
Mean time to analgesia	Severe pain was 106 minutes, 62 minutes for moderate pain and 46 minutes for mild pain	Severe pain was 30 minutes, moderate pain time to analgesia was 40.4 mins, mild pain score analgesia 81.8 mins
Appropriate analgesic (NSAID/ Opiate)	84%	77.5%
Pain reassessment	In only 18% (6 cases) pain was re-evaluated within 60 minutes.	72.5% (29 patients) had their pain re-assessed
Presence of stones	Stones were proven in 15% (5 cases).	
Urinalysis recorded in notes	100% of cases had urinalysis (results recorded in the notes).	100% of patients had urinalysis, but in 2 cases, results were not documented in notes.
Appropriate bloods taken	93.9% (31 cases, FBC, U+Es),	100% had blood for FBC and U+ES which were all documented in notes
Urate and calcium levels	2 patients (6%) had urate and calcium levels taken.	Only 3 cases had urate and calcium levels tested.
Initial investigation	75.8% (25 cases) had X-ray KUBs done as the initial radiological intervention	65% (21 cases) had X-ray KUB as the initial investigation,
X-ray within 24 hours	78.1% (23 cases) being done the same day	79% the same day, then, 9 cases then had NCCT.
None contrast CT?	53.1 % (17 cases) had a NCCT,	75% (30 cases) had NCCT
CT within 24 hours	15% (5) being done within 24 hrs.	50% (15 cases) were the same day
IVU	9% (3 patients) had IVU conducted, one within 24 hrs. 2 as an outpatient.	One case had an OP IVU
Radiology plan in notes	29 patients had a radiology plan in the notes	Radiology plan was documented in notes in 92.5%

within 60 minutes. Stones were proven in 15% (5 cases). 100% of cases had urinalysis (results recorded in the notes). With appropriate bloods being taken in 93.9% (31 cases, FBC, U+Es), but only 2 patients (6%) had urate and calcium levels taken. 75.8% (25 cases) had X-ray KUBs done as the initial radiological intervention, 78.1% (23 cases) being done the same day. 53.1% (17 cases) had a NCCT, 15% (5) being done within 24 hrs. 9% (3 patients) had IVU conducted, one within 24 hrs. 2 as an outpatient. 29 patients had a radiology plan in the notes. 5 patients had neither X-ray KUB nor NCCT (Table 1).

Discussion

We have demonstrated that in the majority of guidelines present, our practice has improved. The majority of patients are currently having their pain re-assessed within one hour after receiving analgesia and are receiving the appropriate analgesic. However whilst 79% of those having X-ray KUB as the primary radiological investigation the same day, only 50% of those having CT are having it done the same day. This demonstrates our interventions have been effective, however we can still improve, especially with regards to timing of radiological investigations. We can aid our service by development of a renal colic protocol/ proforma, on which will be recorded all the information that needs to be addressed, e.g. analgesia, time to analgesia, etc. Included in this will be testing for calcium and urate levels in patients with renal stones, which is currently not done as part of routine care in all patients diagnosed with renal stones. We can review whether this is effective with another re-audit.

Conclusion

We have demonstrated we are following guidelines in the majority of patients, however can still improve service running with further

recommendations. Once clinical changes are in place, we can then re-audit the system again to see if any further change has been caused.

References

1. Ahmed HU, Khan AA, Bafaloukas N, Shergill IS, Buchholz NP (2006) Diagnosis and management of renal (ureteric) colic, *Br J Hosp Med (Lond)* 67: 465-946.
2. Sierakowski R, Finlayson B, Landes RR, Finlayson CD, Sierakowski N (1978) The frequency of urolithiasis in hospital discharge diagnoses in the United States. *Invest Urol* 15: 438-441.
3. Ljunghall S, Danielson BG, Fellstrom B, Holmgren K, Johansson G, et al. (1985) Family history of renal stones in recurrent stone patients. *Br J Urol* 57: 370-374.
4. Curhan GC, Willett WC, Rimm EB, Stampfer MJ (1997) Family history and risk of kidney stones. *J Am Soc Nephrol* 8: 1568-1573.
5. Lasoye TA, Sedgwick PM, Patel N, Skinner C, Nayeem N (2004) Management of acute renal colic in the UK: a questionnaire survey. *BMC Emerg Med* 2004 Dec 7: 4: 5.
6. Vieweg J, Teh C, Freed K, Leder RA, Smith RH, et al. (1998) Unenhanced helical computerized tomography for the evaluation of patients with acute flank pain. *J Urol* 160: 679-684.
7. Shokeir AA, Mahran MR, Abdulmaaboud M (2000) Renal colic in pregnant women: role of renal resistive index. *Urology* 55: 344-347.
8. Vaughan ED Jr, Gillenwater JY (1971) Recovery following complete chronic unilateral ureteral occlusion: functional, radiographic and pathologic alterations. *J Urol* 106: 27-35.
9. Pearle MS1, Pierce HL, Miller GL, Summa JA, Mutz JM, et al. (1998) Optimal method of urgent decompression of the collecting system for obstruction and infection due to ureteral calculi. *J Urol* 160: 1260-1264.
10. Parys B, McClinton S, Watson GM, Anson KM, Burgess N, et al. (2008) BAUS, Section of Endourology Guidelines for acute management of first presentation of renal/ureteric lithiasis. *British Journal of Medical and Surgical Urology* 2: 134-136.

Copyright: © 2016 Goonewardene SS, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Citation: Goonewardene SS, Rajjayabun P (2016) Acute Management of Renal Colic and Compliance with National Standards: Closure of the Audit Loop. *Arch Renal Dis Manag* 2(1): 008-010. DOI: 10.17352/2455-5495.000008