Improving the effectiveness of the emergency management of renal colic in a district general hospital: a completed audit cycle

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Objectives: To assess the current practice of emergency management of renal colic in a district hospital, review literature, implement new guidelines, and assess them.

Methods: Data were collected about the use of analgesia, waiting time for intravenous urography (IVU), and admission status of patients presenting to the hospital with symptoms of renal colic over the period of three months. A literature search into the use of analgesia, imaging, and treatment was performed. Members of the involved departments were consulted and new guidelines developed and implemented. This was followed by further data collection over three months.

Results: Seven of 14 patients were admitted. Five to wait for their IVU. Their average waiting time was 12.3 (SD 2.2) hours. Mainly intramuscular opioid analgesia was used. Literature recommended the use of diclofenac. Although computed tomography was favoured it was decided to continue to use IVU because of circumstances within the hospital. The literature recommended a cut off between conservative and surgical treatment at a calculus size of >4 mm. Existing policies of the relevant departments were obeyed and a training system for the junior doctors was introduced. Emergency department staff were encouraged to perform 3-film IVUs. After this, of 5 of 19 patients were admitted, only one of those to wait for an IVU. The average waiting time for an IVU was 4.1 (SD 0.96) hours. Rectal diclofenac was noted to be the drug of choice.

Conclusion: Coordination of efforts, interdepartmental communication, and a practical application of available literature has resulted in a significant improvement of effectiveness without affecting medical standards, workload, or resources. Accident and emergency senior house officers felt highly satisfied at being able to complete management from presentation to diagnosis and treatment. Interdisciplinary communication has to be continued to maintain smooth operation of the guidelines.

The emergency management of renal colic (RC) in the UK differs from hospital to hospital. General practitioners refer to specialists as well as to emergency departments (ED). The type of analgesia given on presentation ranges from simple paracetamol to intravenous administration of opioid. Baseline investigations like full blood count, urea and electrolytes, and urine dipstick for blood are commonly used. The choice of imaging, intravenous urography (IVU), or spiral computed tomography (CT), depends on the availability of resources. At our hospital various analgesia were used. Invariably an IVU was performed, requested by urology medical staff not out of hours. The delay between presentation and imaging led to the patient being admitted to a ward for a day or more without the need for inpatient treatment.

We therefore conducted an audit of our work with the aim to implement new guidelines to coordinate the emergency management of RC and thereby improving patient satisfaction and clinical effectiveness.

METHODS

Over the period of three months ED and urology medical staff collected data of all patients presenting with symptoms of RC. The use of analgesia was recorded as well as the admission status and the waiting time for the IVU after the first medical review. The data were statistically analysed.

A literature search was undertaken to establish the best standards. The heads of each discipline involved in the patients care were consulted. New agreed guidelines were implemented. After this the data collection was repeated over three months and the results statistically analysed.

RESULTS

Initial observations

Fourteen patients presented with symptoms of renal colic. Seven were admitted to a ward, of which five only required oral or rectal analgesia. The average waiting time for an IVU was 12.3 (SD 2.2) hours.

Intramuscular pethidine was given in eight cases as analgesia followed by rectal (4) and oral diclofenac (2).

Literature search

The literature favoured diclofenac as analgesia. It reduces the colic recurrence rate and is regarded as superior to pethidine and other analgesics. CT compared with IVU is faster, contrast free, highly sensitive, and it avoids further tests. It is associated with a three times higher radiation dose and requires the presence of a radiologist to interpret. One study did not find any difference between the use of CT and IVU in an ED setting.

It has been found that ureteric calculi of <3 mm pass spontaneously in 80%–92% of the cases, whereas stones sized >6 mm only pass in 28%–40% of cases.

Departmental requirements

The presence of one ED doctor in the department is required at all times. The radiology department is not part of the ED. Guidelines of the radiology department and of the Royal College of Radiologists were to be obeyed and required that the requesting doctors attend an induction session into the use of contrast media. The shift system of the radiographers did not

Abbreviations: RC, renal colic; IVU, intravenous urography; CT, computed tomography
Working diagnosis "Renal colic"
(with history, examinations, and observations)

Pain management
1st choice if contraindicated: 2nd choice
Diclofenac 100 mg pr
Co-codamol 30/500 2 tabl.
if required: antiemetic
Tramadol 100 mg po/im/iv
Paracetamol 1 g pr/po
if pain not relieved: Pethidine 50–100 mg im

Investigations
FBC, U + E, Ca, urate, glucose
Urine dipstick for blood
3-film IVU

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Discharge, if
• partial obstruction
• ureteric/PUJ calculus ≤ 4 mm
• only po/pr analgesia required
• normal blood results
• normal observations
• general fitness

Give
• OPA with consultant urologist on call in 2-3/52
• KUB/IX for OPA
• Take home pr/po analgesia (1st or 2nd choice)
• Advice to come back if pain not manageable
• Advice on high fluid intake and balanced diet

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Admit, if
• complete obstruction at 1 h
• ureteric calculus > 4 mm
• Pethidine required
• impaired renal function
• generally unwell, pyrexia
• TWCC
• significant other illnesses
• inability to cope at home

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Figure 1 Guidelines for the emergency management of renal colic. FBC, full blood count; U&E, urea and electrolytes.

allow CT to be performed out of hours without additional manpower. The urology department required all junior doctors involved to attend an induction session about the diagnosis and management of renal colic.

The new guidelines
The flowchart shows the proceedings of the new guidelines (fig 1). A teaching session on the diagnosis and management of renal colic as well as an induction into the use of contrast media was arranged.

Final observations
Nineteen patients presenting with symptoms of RC were all treated according to the guidelines. Four were admitted to the ward, one only waiting for an IVU. The average waiting time for an IVU was 4.11 (0.96) hours. In 16 cases rectal diclofenac was given and in three cases tramadol.

In comparison with the first observation period the average waiting time for an IVU was reduced by 75%. The rate of admissions was reduced from 50% to 21% and the number of unnecessary admissions decreased from 71% to 25%. The differences in all comparisons were significant (p<0.001). No complication during treatment and follow up due to the new guidelines was reported.

DISCUSSION
Coordination of efforts, interdepartmental communication, and a practical application of available literature has resulted in a significant improvement of effectiveness without affecting medical standards, workload, or resources. The local facilities could not provide a CT out of hours without a major effort. Supported by literature we chose the slightly less valuable IVU as the standard test. On the background of a recent meta-analysis of the same group confirming the superiority of CT scans to IVU, the aim should remain to provide CT as standard investigation. Interdisciplinary communication should be continued to maintain these standards.

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