

Role of Plain X-Ray KUB And Renal Ultrasound in Evaluation Of Renal Colic

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ABSTRACT

Objectives: The purpose of the study was to determine the role of plain x-ray abdomen KUB and renal ultrasound in evaluation of patients with renal colic. **Methods:** This study was conducted in the Urology Unit of surgical department at District Headquarter Hospital Rawalpindi from January to March 2009. A total of 76 patients with the clinical diagnosis of renal colic were included in this study. All these patients initially presented in emergency with renal colic and then followed up in outdoor. After complete history and clinical examination they were investigated with, plain x-ray KUB and renal ultrasound. Findings were noted and compared with each other. **Results:** Out of 76 patients 57 patients (75%) were male and 19 patients (25%) were female.

Male to female ratio was 3:1. Sixty three patients (83%) presented between 3rd to 5th decades of life. Forty three patients (57%) presented with left renal colic while 33 patients (43%) presented with right renal colic. Thirty patients (40%) were diagnosed by plain x-ray KUB while 37 patients (47%) were diagnosed by renal ultrasound. When x-ray KUB and renal ultrasound were combined, diagnosis was possible in 46 patients (60%). Urolithiasis in 46 patients (60%) out of 76 patients with renal colic was diagnosed by performing x-ray KUB and renal ultrasound. **Conclusion:** Urolithiasis, the most common cause of renal colic can be effectively diagnosed with x-ray KUB and renal ultrasound. **Key Words:** Renal colic, X-ray KUB, Renal ultrasound.

INTRODUCTION

Renal colic is one of the most common causes of acute abdomen in patients presenting in emergency. Renal colic is most commonly caused by urolithiasis.¹ Common locations for stone to become impacted include renal infundibulum, the ureteropelvic junction, the crossing of the iliac vessels and the ureterovesical junction, which is the most constricted area through which the stone must pass.² The main purpose of evaluation in patients with renal colic is to confirm the diagnosis, to find out the cause, and to assess the level and degree of obstruction. Appropriate selection of investigations depends largely on their availability and cost effectiveness.³ Intravenous urography (IVU) has been the gold standard investigation providing information regarding the site, size of the stone and degree of obstruction.⁴ Recently computerized tomography (CT) scan has come up as an effective investigation for the evaluation of renal colic (5-8). The purpose of this study was to assess the role of

X-ray KUB and renal ultrasound in evaluation of patients with renal colic.

MATERIAL AND METHODS

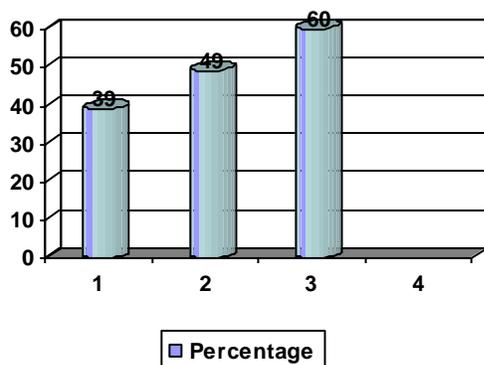
This prospective study was conducted January to March 2009 in Urology Unit of Rawalpindi Medical College. A total of 76 patients of both sexes above the age of 12 years were included in this study. All these patients were presented in emergency department and then followed up in urology outdoor. After complete history and clinical examination they were investigated with x-ray KUB and renal ultrasound. In x-ray KUB radio-opaque shadows in the renal area and in the line of ureter were noted. On ultrasound renal stones and presence and degree of hydronephrosis were noted.

RESULTS

Out of 76 patients, 57 patients (75%) were male and 19 patients (25%) were female. Male to female ratio was 3:1. Age of patients ranged from 13 to 89 years.

Sixty three patients (83%) presented in between 3rd to 5th decade of life. Forty three patients (57%) presented with left renal colic, while 33 patients (43.%) presented with right renal colic. On x-ray KUB in 30 out of 76 patients (40%) stone was visible as radio-opaque shadow. Out of these 30 positive KUB, stones were in the ureter in 20 patients (8 in upper, 3 middle and 9 in lower ureter) while in 10 patients stones were in the kidney. On renal ultrasound in 37 out of 76 patients (47%) diagnosis was made. Out of these 37 patients, there was hydronephrosis in 26 patients while in 11 patients there were renal stones. Seven more patients were diagnosed as compared to KUB, in these 7 patients there was renal stone in one and hydronephrosis in 6 patients. With both x-ray KUB and renal ultrasound, in 46 out of 76 patients (60%) diagnosis was possible, in 9 more patients ureteric stones were visible on x-Ray KUB as compared to ultrasound alone (Figure. 1).

Figure-1
Percentage of positive x-ray and renal ultrasound



- 1) X-Ray KUB only
- 2) Renal Ultrasound only
- 3) Both X-Ray KUB and Renal Ultrasound combined

With these investigations diagnosis could not be made in 20 patients.

DISCUSSION

Renal colic is a common clinical problem which might be caused by a variety of urinary and extra urinary abnormalities among which ureterolithiasis being the most frequent cause. Intravenous urography (IVU) has been the standard imaging

procedure of choice for the evaluation of renal colic over the last decades. Direct detection of even small ureteric calculi is achieved in 40-60%, whereas using indirect signs such as ureteric and renal pelvic dilatation stone detection is possible in up to 80-90% of all cases. However IVU might be hampered by poor quality due to lack of bowel preparation, by nephrotoxicity of contrast agents, by serious allergic and anaphylactic reaction in 10% and 1% of the patients respectively and by significant radiation exposure (9, 10). Since its introduction by Smith et al in 1995 (5), unenhanced helical computed tomography (CT) has revolutionized the imaging evaluation of renal colic. Unlike IVU, CT is fast usually does not require the administration of contrast material and require no patients bowel preparation. Although CT has become the standard reference in detection of urinary calculi with its high sensitivity (95-98%) and specificity (98-99%) the world over (11-13). Cost and availability are the major limitations of its use in our set up. Almost 90% of Urinary calculi are radio-opaque and can be diagnosed by plain film radiography of the kidneys, ureters and bladder (KUB). However, while large calculi can easily be seen, confounding factors such as overlying bowel gas or fecal material and osseous structures such as transverse processes or the sacrum can easily hide small calculi. Radiolucent and small stones are also not visible on KUB. This could explain the non-visibility of stones in seven patients in spite of positive findings on ultrasound in our study. A recent study with 178 patients showed a sensitivity of 45% but a specificity of 77% which are similar to findings in our study with sensitivity of 40% (14). The use of renal Ultrasonography (US) in the management of renal colic has been growing. When combining the findings of pyeloureteral dilatation and direct visualization of the stone, the sensitivity of US can be high, 37-64% for calculi detection and 74-85% for detection of acute obstruction (15-19). In the study of Arain GM et al, the presence of positive criteria was observed in 105 out of 121 patients (86.8%) (20). In another study with the help ultrasound urolithiasis was observed in 291 patients out of 296 patients .²¹

CONCLUSION

Thus, with the data presented in this study, it is concluded that x-ray KUB and Renal ultrasound are

effective and their easy availability and cost effectiveness make them the initial investigations of choice in the evaluation of patients with renal colic.

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