

A study of USG in the evaluation of renal colic patients at tertiary health care center

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Abstract

Background: The emergency department investigation of a patient with acute flank pain associated with hematuria has traditionally included an excretory urogram to exclude or confirm the clinical suspicion of ureteric calculi. **Aims and Objectives:** To Study USG in the evaluation of Renal colic patients at tertiary health care center. **Methodology:** All patients presenting with symptoms typical of renal colic attending the medicine and surgical OPD in B V (Deemed to be University) M C & Hospital, Sangli. were included into study while Pregnant women excluded from the study. Plain X-ray KUB, Ultrasound and CT scan study were done in 104 patients presenting with symptoms typical of renal colic attending the medical and surgical OPD in B V (Deemed to be University) M C & Hospital, Sangli., CT imaging was performed using Philips 16 Slice CT Scanner. The data was analyzed by T-test in statistical package for the social science (SPSS). **Result:** USG positive in 74 people-71.15%, As per site Kidney-positive in 36 people-97%, Ureter-positive in 26 people -48.1%, Bladder-positive in 6 people-100%, Urethra -positive in 6 people-100%. CT is superior to ultrasound and radiograph in all areas ultrasound is more sensitive for detecting renal, bladder and urethra calculi radiograph is more sensitive for detecting ureter, bladder and urethra calculi when compared to renal calculi. CT imaging is superior to ultrasound (97%) and radiograph (55%) for detection of calculi in kidney. For detection of calculi in ureter CT is superior to radiograph (64%) and ultrasound (48%).CT and ultrasound are equally sensitive and superior to radiograph for detecting urethral calculi. **Conclusion:** It can be concluded from our study that CT was superior to USG and Radiograph for overall detection of renal calculi but USG was superior to radiograph and if the condition of hydro nephrosis is considered the USG is useful as CT found useful in the management of renal calculi.

Key Words: Renal colic, Renal calculi, UTI (Urinary Tract Infections), Hydro nephrosis.

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INTRODUCTION

The emergency department investigation of a patient with acute flank pain associated with hematuria has traditionally included an excretory urogram to exclude or confirm the clinical suspicion of ureteric calculi.¹ This investigation, however, has a number of relative

contraindications, including significant renal insufficiency, dehydration, past reaction to contrast agents, and pregnancy.² The availability of nonionic contrast media has reduced the risk of reaction but has added significantly to the cost of investigation. Ultrasound is a safe, noninvasive imaging modality that is used to evaluate intraperitoneal and retroperitoneal structures successfully.³ It has also been used to study the urinary tract.⁴ Limited studies have been published concerning its role in the diagnosis of renal calculi.⁵⁻⁷

MATERIAL AND METHODS

All patients presenting with symptoms typical of renal colic attending the medicine and surgical OPD in B V (Deemed to be University) M C & Hospital, Sangli. were included into study while Pregnant women excluded from the study. Plain X-ray KUB, Ultrasound and CT scan study were done in 104 patients presenting with

symptoms typical of renal colic attending the medical and surgical OPD in B V (Deemed to be University) M C & Hospital, Sangli. Plain X-ray KUB was taken after bowel preparation and on empty stomach. Films were taken in 500 ma machine. Ultrasound imaging was performed in the department of radiodiagnosis B V (Deemed to be University) M C & Hospital, Sangli., using real time ultrasound machine (Philips HD 15) which is equipped

with 2.6,3.5 and 5 MHZ and HP image point Hz which is equipped with 2 to 10 MHZ and curvilinear probes. Patients were examined in empty stomach and full urinary bladder in the supine position. CT imaging was performed in the department of radiodiagnosis B V (Deemed to be University) M C & Hospital, Sangli, using Philips 16 slice CT Scanner. The data was analyzed by T-test in statistical package for the social science (SPSS).

RESULT

Table 1: Ultrasound Vs CT

| | | CT calculus | | | | | Total | % |
|-----------------|---------|-------------|-----------|----------|----------|----------|------------|------|
| | | Kidney | Ureter | Bladder | Absent | Urethra | | |
| USG Calculus | Kidney | 33 | 3 | 0 | 0 | 0 | 36 | 97 |
| | Ureter | 1 | 25 | 0 | 0 | 0 | 26 | 48.1 |
| | Bladder | 0 | 0 | 6 | 0 | 0 | 6 | 100 |
| | Absent | 6 | 20 | 0 | 4 | 0 | 30 | |
| | Urethra | 0 | 0 | 0 | 0 | 6 | 6 | 100 |
| Total | | 40 | 48 | 6 | 4 | 6 | 104 | |

(P<0.05)

In present study USG positive in 74 people-71.15%.As per site Kidney-positive in 36 people-97%, Ureter-positive in 26 people-48.1%, Bladder-positive in 6 people-100%, Urethra -positive in 6 people-100%.

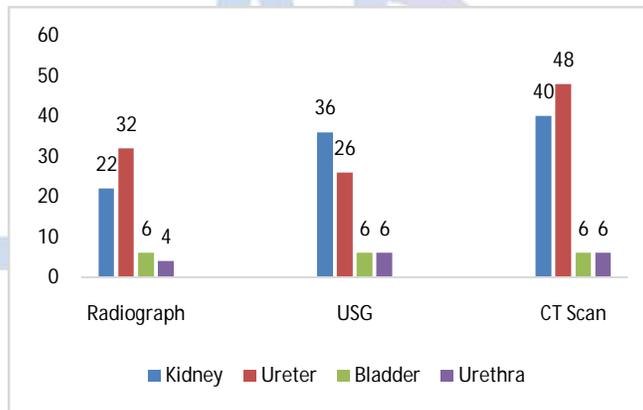


Figure 1: Comparison between Radiograph, Ultrasound and CT

In present study CT is superior to ultrasound and radiograph in all areas ultrasound is more sensitive for detecting renal, bladder and urethra calculi radiograph is more sensitive for detecting ureter, bladder and urethra calculi when compared to renal calculi. In present study CT imaging is superior to ultrasound (97%) and radiograph (55%) for detection of calculi in kidney. For detection of calculi in ureter CT is superior to radiograph (64%) and ultrasound (48%). In present study Ultrasound has poor rate of detection when compared to radiograph and CT for ureteric calculi. In present study CT and ultrasound are equally sensitive and superior to radiograph for detecting urethral calculi.

DISCUSSION

The role of ultrasound to delineate renal structure is well recognized. Ultrasound can detect renal tract dilatation with a high degree of accuracy.⁹ Ultrasound can also detect renal calculi, although difficulties arise in the midureter where the calculus and associated hydroureter may be obscured by overlying bowel gas. Previous comparisons of ultrasound and excretory urograms have given conflicting results. Hill *et al*¹⁰ studied 61 patients referred for outpatient excretory urography. Forty-one of the 61 were subsequently found to have a calculus. Ultrasound detected 66% of the calculi, while the excretory urogram detected 85%. Ultrasound was able to detect calculi at the ureterovesicle junction better than the excretory urogram. It should be noted that these patients were not studied in emergency situations, and their preparation for examination was optimal. None of their

patients had surgery. Ultrasound has been found to be less accurate in detection of renal stones compared to CT scan.¹¹ However, unilateral hydronephrosis in addition to finding of stone on ultrasound increases its sensitivity to 81.3-82.4% in identifying nephrolithiasis.^{12,13} We included finding of unilateral hydronephrosis with or without nephrolithiasis as a criteria for an “abnormal ultrasound”. Use of ultrasound as an initial imaging study is also justified based on several studies which have shown no difference in patient management and outcomes between ultrasound and CT scan in a patient with suspected nephrolithiasis.¹⁴⁻¹⁷ Ultrasound was found to be 97% sensitive in predicting need for surgical intervention when it showed a stone and/or hydronephrosis in patients presenting with renal colic.¹⁴ In other studies, rate of urological intervention was significantly lower^{16,18} or no patients required admission within 30 days¹⁷ in those with normal results on ultrasound. In our study we have seen that USG positive in 74 people-71.15%, As per site Kidney-positive in 36 people-97%, Ureter-positive in 26 people -48.1%, Bladder-positive in 6 people-100%, Urethra -positive in 6 people-100% CT is superior to ultrasound and radiograph in all areas ultrasound is more sensitive for detecting renal, bladder and urethra calculi radiograph is more sensitive for detecting ureter, bladder and urethra calculi when compared to renal calculi. CT imaging is superior to ultrasound (97%) and radiograph (55%) for detection of calculi in kidney. For detection of calculi in ureter CT is superior to radiograph (64%) and ultrasound (48%). In present study Ultrasound has poor rate of detection when compared to radiograph and CT. CT and ultrasound are equally sensitive and superior to radiograph for detecting urethral calculi.

CONCLUSION

It can be concluded from our study that CT was superior to USG and Radiograph for overall detection of renal calculi but USG was superior to radiograph and if the condition of hydro nephrosis is considered the USG is useful as CT, and found useful in the management of renal calculi.

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