Original Article

Is Ultrasound Detect Renal Infections?

Detection of Renal Infection on Ultrasound

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ABSTRACT

Objective: To asses culture and sensitivity of renal infection patients detected on ultrasound
Study Design: Prospective cohort study
Place and Duration of Study: This study was conducted at the Rimsha Medical Center Dadu from January 2012 to June 2015.
Materials and Methods: Hundred patients suffering for renal infection detected on ultrasound were included in the study. Diabetic and urolithiasis patients excluded from the study. Urine culture and sensitivity of renal infection patients detected on ultrasound carried from collection point of diagnostic and research laboratory liaqaut university of medical & health sciences Jamshoro/Hyderabad in Dadu.
Results: Out of 100 patients 65 (65%) were female and 35(35%) male. The age of the patients ranged from 15 to 45 years with mean age 28.9 SD±8.8 The presenting features were lumbar pain with on and off fever in 60(60%) cases, dysuria in 15(15%), and in 35(35%) cases was asymptomatic. The renal infection detected in ultrasound bilaterally in 30(30%), Right sided in 35(35%), left sided in 25(25%) and chronic pyelonephritis (change of small size kidney with increase echogenicity and small size kidney with irregular border) in 10(10%) cases. culture and sensitivity seen positive in 27(27%) cases. Pyuria and haematuria seen in 17(17%). The commonest micro-organism detected E.coli in 60(60%), Klebsiella 15(15%), Proteus 5(5%),Enterococcus 5(5%), staphylococcus saprophyticus 5(5%), streptococcus 7(7%), Pseudomonas 3(3%) and insignificant mixed bacterial growth seen in 7 cases. Drug senstivity seen in 100% with meronam, pipracilllin/tazobactam, aztreonam. Nitrofurantoin and amikacin 90% Amoxi-clavulanic acid in fusidic acid, ceftrixone, cotirmoxazole, ofloxin, cefuroxime, cefixime 75% and resistance pattern seen more in ceftazidime, gentamycin, ciprofloxacin and ampcillin.
Conclusion: Renal infection detected on ultrasound even with insignificant pyuria and haematuria should not be neglected because having significant positive culture and sensitivity report findings.
Key Words: Renal infection, ultrasound, culture and sensitivity

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INTRODUCTION

Renal infection (bacterial pyelonephritis) refers to any inflammation affecting the renal interstitium. Patients most often affected are females from 15- to 40-years-old. Predisposing conditions include neuropathic bladder, prolonged catheter drainage, urine reflux, bladder malignancy, urinary bladder outlet obstruction, clinical Benign prostatic enlargement, calculus disease, altered host resistance, congenital anomalies, analgesic abuse, diabetes, sexual activity and pregnancy.[1,8] Renal infection is presenting fairly specific and classical in most cases, consisting of rapid onset of high fevers and flank pain and tenderness.

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In many instances less specific or non-urinary symptoms and signs may also be present which may lead to clinical confusion.[2,4] A renal infection requires prompt medical attention. If not treated properly, a renal infection can permanently damage kidneys by renal abscess, renal infarction, necrosis, scarring, chronic renal impairment and hypertension. The most commonly implicated micro organisms are E. coli (most common), Klebsiella , Proteus, Enterobacter and Pseudomonas.[8,14]

Ultrasound is insensitive to the changes of acute pyelonephritis, with most patients having normal' scan, and abnormalities only identified in 25% of cases. Possible features like particulate matter in the collecting system, gas bubbles (emphysematous pyelonephritis), abnormal echogenicity of the renal parenchyma and focal/segmental hypoechoic regions, increase diameter> 50 millimeter in transverse section with prominent pyramids seen in kidney. However ultrasound also useful in assessing for local complications such as hydronephrosis, renal abscess formation, renal infarction, perinephric collections, and thus guiding

management.[1,7] Still some radiologist use term renal infection when above finding is noted in ultrasound but still that's debatable. So our aim of study to asses culture and sensitivity of renal infection patients detected on ultrasound

MATERIALS AND METHODS

A Prospective cohort study of 100 cases of renal infection carried out at Rimsha medical center Dadu from Jan. 2012 to June 2015. The study was approved by the ethical review committee and informed consent was personally obtained from the patients. Hundred patients suffering for renal infection detected on ultrasound were included in the study. Neuropathic bladder, prolonged catheter drainage, urine reflux, bladder malignancy, urinary bladder outlet obstruction, clinical Benign prostatic enlargement and calculus disease patients excluded from the study. Urine culture and sensitivity of renal infection patients detected on ultrasound carried from collection point of diagnostic and research laboratory liaqaut university of medical & health sciences Jamshoro/Hyderabad in Dadu, in all cases to asses pattern of urine culture and sensitivity.

RESULTS

Out of 100 patients, 75(75%) were female and 25(25%) male. The age of the patients ranged from 15 to 45 year with mean age 28.9SD=8.8 The presenting features were lumbar pain with on & off fever in 60(60%) cases, dysuria in 15(15%), and in 35(35%) cases were asymptomatic. The acute renal infection /acute pyelonephritis suspected from increased echotexture of kidney, increase diameter> 50 millimeter in transverse section with prominent pyramids seen in bilaterally in 30(30%),Right sided in35(35%), left sided in 25(25%) and chronic pyelonephritis in 10(10%) cases. culture and sensitivity seen positive in 27(27%) cases. Pyuria and haematuria seen in 17(17%). Urine culture and sensitivity showed commonest micro-organism detected E.coli in 60(60%), Klebsiella 15(15%), Proteus 5(5%), Enterococcus 5(5%), staphylococcus saprophyticus 5(5%), streptococcus 7(7%), Pseudomonas 3(3%) and insignificant mixed bacterial growth seen in 7(7%). Drug sensitivity seen in 100% with meronam, pipracillin/tazobactam. Nitrofurantoin and amikacin in 90%. Amoxi- clavulanic acid and fusidic acid, ceftrixone, cotrimoxazole, ofloxacin, cefixime 75% and resistance pattern seen more in ciprofloxacin, pencillin and ampcillin.

Figure No.1. Various ultrasounds show renal infection

DISCUSSION

The aim of imaging in renal infection is to detect conditions that must be treated in order to avoid immediate deterioration or recurrences, and long-term kidney damage.[4,9] In our study of 100 patients of renal infection suspected on ultrasonography 75(75%) were female and 25(25%) male. The age of the patients ranged from 15 to 45 years with mean age28.9 SD±8.8 which is comparable to Bjerklund TE study.7 The presenting features were lumbar pain with on and off fever in 60(60%) cases, dysurea in 15(15%), and in 35(35%) cases was asymptomatic. The renal infection seen in bilaterally in 30(30%),right sided 35(35%), left sided 25(25%) and chronic pyelonephritis increased echogenicity, small size kidney with irregular border) 10(10%) cases. Pyuria and haematuria seen in 17(17%) which is also comparable to secondary data.[5,10] Our study hypothesis was that there is co-relation of renal infection detected on ultrasound with UTI, is some thing true but verbal communication with various radiologists are in favour of null hypothesis that there is no co-relation among renal infection detected on ultrasound with UTI so we collect 100 sample of urine for culture and sensitivity of renal infection detected by ultrasound and found culture and sensitivity positive in 27(27%) cases with P-value 0.02 which is statistically significant hence adequate evidence against the null hypothesis.The commonest micro-organism detected E.coli in 60(60%), Klebsiella 15(15%), Proteus 5(5%), Enterococcus 5(5%), staphylococcus saprothyticus 5(5%) , streptococcus 7(7%), Pseudomonas 3(3%) and insignificant mixed bacterial growth seen in 7(7%). Drug senstivity seen in 100% with meronam, tazobactam. Nitrofurantoin and amikacin seen in 90%. Cavulanic acid and fusidic acid, ceftrixone, cotrimaxole, ofloxin, cefixime seen in 75% and resistance pattern seen more in ciprofloxacin, pencillin and ampcillin which is comparable to Rossleigh MA study.[11-13] So we recommended that renal infection

detected on ultrasound even with insignificant pyuria and haematuria should not neglected because our study showed 27(27%) positive cases of culture and sensitivity cases with p.value 0.02 which is statistically significant . How ever further studies needed to confirm that renal infection detected on ultrasound have co-relation with positive cases of culture and sensitivity.

CONCLUSION

Renal infection detected on ultrasound even with insignificant pyuria and haematuria should not be neglected because having significant positive culture and sensitivity report findings.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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