

**An Observational Assessment of Renal and Perinephric Space Infection among Urology Patients****Himanshu Kumar<sup>1</sup>, Pankaj Kumar Choudhary<sup>2</sup>, Hari Shankar Prasad<sup>3</sup>**<sup>1</sup>Senior Resident, Department of General Surgery, JLNMCH, Bhagalpur, Bihar, India<sup>2</sup>PG-Student, Department of General Surgery, JLNMCH, Bhagalpur, Bihar, India<sup>3</sup>Assistant Professor, Department of General Surgery, JLNMCH, Bhagalpur, Bihar, India

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Conflict of interest: Nil

**Abstract****Aim:** The aim of the present study was assessing the spectrum of renal and perinephric space infection among urology patients.**Methods:** The present study was conducted in the Department of General Surgery, for the period of 9 months. 50 patients were included in the study. Suspected patients were clinically evaluated and investigated using ultrasound scan of the abdomen. When the findings were suggestive of renal and perinephric space infection, plain and contrast-enhanced computed tomogram (CECT) scan of the abdomen was done to confirm the diagnosis and grade the abscess.**Results:** Out of 50 patients, 30 (60%) males and 20 (40%) females suffered from renal and perinephric space infections in the age group of 10-70 years. Majority (40%) were young in the age group of 21-30 years. At the time of presentation, the commonest symptom was fever (96%) followed by flank pain (40%) weakness and lethargy (70%). The average duration of symptoms was 23 days (range 7-60 days). On clinical examination, all patients were febrile (range 99- 103°F) with marked costovertebral tenderness in 92%. It was seen that 24 (48%) patients had renal abscess, 20 (40%) perinephric abscess and 6 (12%) emphysematous pyelonephritis. The predisposing factors were diabetes mellitus (36%), ureteric calculi (30%) and renal calculi (24%) in these patients. 30 patients were treated with antibiotics only and 10 patients were treated with antibiotics+ PCD. In 2 patients, there was drainage of pus and debris.**Conclusion:** Renal and perinephric space infection continues to be a serious urological problem with high mortality rate. A high index of suspicion, prompt diagnosis, appropriate antibiotics and surgical intervention may be effective in reducing mortality.**Keywords:** Renal Abscess; Perinephric Abscess.

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**Introduction**

Renal abscess, which is extremely rare in pediatrics, has a long treatment period and is highly destructive to the kidneys. It is an extremely serious type of kidney infectious disease. The clinical manifestations are non-specific, including fever, abdominal pain, nausea, vomiting, and hematuria. [1-3] There is often a history of cold or surgery before the onset of the disease. The most common pathogens are *Escherichia coli* and *Staphylococcus aureus* [1,3,4], which may be retrograde or hematogenous. Potential susceptibility factors include diabetes, vesicoureteral reflux, pelvic ureteral duplication malformation, and nephrolithiasis. [3-6] With the development of imaging technology, renal abscess can be diagnosed by B-ultrasound, CT, and MRI. Conservative anti-infective therapy is recommended first. However, abscess puncture

drainage or even single nephrectomy can be used in children with initial treatment failure. [7,8]

Complications of urinary tract infections (UTIs) and hematogenous seeding from primary infected sites are the common source of infection. [10,11] Additionally, rupture of renal cortical abscess or renal carbuncle can result in the formation of PNA. [10] As a result of its anatomical location and potential to spread, RA is potentially lethal and the prognosis can be poor, especially in immunosuppressed and cachectic patients. [9,12] PNA originates from hematogenous dissemination, and often has an acute presentation with pain and high spiking temperatures [10], while in most cases, PNA is notoriously silent clinically [10,11], thereby the diagnosis can be challenging. [10] It is reported that only 35%-38% of patients with PNA are correctly diagnosed at the time of admission.

[13,14] The mortality rates of RA and PNA in recent series are reported to range from 1% to 14% [12,15,16], while complicated abscess may carry a higher mortality. [9]

The aim of the present study was assess the spectrum of renal and perinephric space infection among urology patients.

### Materials and Methods

The present study was conducted in the Department of General Surgery, JLNMCB, Bhagalpur, Bihar, India for the period of 9 months. 50 patients were included in the study. Suspected patients were clinically evaluated and investigated using ultrasound scan of the abdomen. When the findings were suggestive of renal and perinephric space infection, plain and contrast enhanced computed

tomogram (CECT) scan of the abdomen was done to confirm the diagnosis and grade the abscess.

After the diagnosis, all patients were put on combination antimicrobial regime in form of injection ceftriaxone 2 gm tid, injection amikacin 500 mg bid and injection metronidazole 500 mg tid as the first line therapy, good hydration and close monitoring for symptomatic relief, decrease in fever, flank pain and local tenderness. In cases of poor improvement in 48 hours, the regime was upgraded to injection ceftazidime 2 gm tid and ultrasound guided percutaneous drainage /surgical exploration was considered. After recovery, patients were re- evaluated at four to six weeks for abscess resolution and management of other predisposing factors (obstructing renal or ureteric calculi, diabetes mellitus).

### Results

**Table 1: Patient's profile and clinical data**

<b>Gender</b>	<b>N (%)</b>
Male	30 (60)
Female	20 (40)
<b>Age in years</b>	
10-20	1 (2)
21-30	20 (40)
31-40	15 (30)
41-50	10 (20)
51-60	3 (6)
>60	1 (2)
<b>Side</b>	
Right	28 (56)
Left	22 (44)
<b>Predisposing factors</b>	
UTI	5 (10)
Renal calculi	12 (24)
Ureteric calculi	15 (30)
Renal and ureteric calculi	1 (2)
Diabetes mellitus	18 (36)
Chronic renal failure	3 (6)
End stage renal disease	1 (2)
<b>Presenting symptoms</b>	
Pain in flanks	20 (40)
Fever with chill and rigor	48 (96)
Loss of weight	10 (20)
Weakness/lethargy	35 (70)
Pyuria	1 (2)
Decreased urine out	1 (2)
<b>Clinical findings</b>	
Fever	49 (98)
Costovertebral tenderness	46 (92)
Palpable lump	15 (30)
<b>Diagnosis</b>	
Renal abscess	24 (48)
Perinephric abscess	20 (40)
Emphysematous pyelonephritis	6 (12)

Out of 50 patients, 30 (60%) males and 20 (40%) females suffered from renal and perirenal space infections in the age group of 10-70 years. Majority (40%) were young in the age group of 21-30 years. At the time of presentation, the commonest symptom was fever (96%) followed by flank pain (40%) weakness and lethargy (70%). The average duration of symptoms was 23 days (range 7-60

days). On clinical examination, all patients were febrile (range 99- 103° F) with marked costovertebral tenderness in 92%. It was seen that 24 (48%) patients had renal abscess, 20 (40%) perinephric abscess and 6 (12%) emphysematous pyelonephritis. The predisposing factors were diabetes mellitus (36%), ureteric calculi (30%) and renal calculi (24%) in these patients.

**Table 2: Treatment and outcome**

Treatment	No. of patients	Nephrectomy	Death
Antibiotics alone	30	-	-
Antibiotics + PCD	10	4	1
Antibiotics + urinary drainage	5	-	-
Antibiotics + exploration			
Drainage of pus & debris	2	-	-
Nephrectomy	4	4	2
Ureterolithotomy	10	-	1

30 patients were treated with antibiotics only and 10 patients were treated with antibiotics+ PCD. In 2 patients, there was drainage of pus and debris.

### Discussion

Suppurative infections of the kidney and perinephric space are uncommon. However, they can cause significant morbidity and mortality. [17,18] These infections affect both sexes equally except renal cortical abscess, which is three times more common in males. The incidence also increases in elderly and those with associated obstructive uropathy. [19-21] These infections are either intrarenal (cortical) or perirenal. [17] Ten percent of renal cortical abscesses rupture through the capsule forming a perinephric abscess, which is difficult to manage and carries a poor prognosis. [19] The mortality is high even after surgical intervention. [22,23] The clinical differentiation is difficult and computerized tomography (CT) scan is the best method to identify a renal cortical or perinephric abscess. [24]

Out of 50 patients, 30 (60%) males and 20 (40%) females suffered from renal and perirenal space infections in the age group of 10-70 years. Majority (40%) were young in the age group of 21-30 years. At the time of presentation, the commonest symptom was fever (96%) followed by flank pain (40%) weakness and lethargy (70%). The average duration of symptoms was 23 days (range 7-60 days). On clinical examination, all patients were febrile (range 99- 103° F) with marked costovertebral tenderness in 92%. It was seen that 24 (48%) patients had renal abscess, 20 (40%) perinephric abscess and 6 (12%) emphysematous pyelonephritis. The predisposing factors were diabetes mellitus (36%), ureteric calculi (30%) and renal calculi (24%) in these patients. 30 patients were treated with antibiotics only and 10 patients were treated with antibiotics+ PCD. In 2 patients, there was drainage of pus and debris. Successful treatment of renal abscess requires prolonged

intravenous and oral antibiotics while surgical or percutaneous drainage is reserved for non-responders. [25,26]

Perinephric abscesses usually occur because of disruption of a corticomedullary intranephric renal abscess, recurrent pyelonephritis, xanthogranulomatous pyelonephritis or an obstructing renal pelvic stone causing pyonephrosis. Gram negative bacterial abscess commonly develops due to rupture of corticomedullary abscess while the staphylococcal infection develops due to rupture of a renal cortical abscess. Approximately 30% of cases are attributed to haematogenous dissemination from other sites of infection such as wound infection, furuncles or pulmonary infection. Abscess can also occur from ascending urinary tract infection, the presenting symptoms of which are nonspecific. [27] Factors associated with antimicrobial treatment failure are large abscesses, obstructive uropathy, severe vesico- ureteral reflux, diabetes, old age and urosepsis with gas forming organisms. A drainage procedure should be considered when there is a large abscess and no clinical improvement occurs after 48 to 72 hours of appropriate antibiotic therapy. [20] If obstructive uropathy is present, prompt drainage by percutaneous nephrostomy should be performed and the lesion corrected once the patient is stable and afebrile. If open drainage is required, an incision and drainage is preferred while nephrectomy is reserved for patients whose renal parenchyma is diffusely damaged and for elderly patients whose survival depends upon urgent surgical intervention. [28]

### Conclusion

Renal and perinephric space infection continues to be a serious urological problem with high mortality rate. A high index of suspicion, prompt diagnosis, appropriate antibiotics and surgical intervention may be effective in reducing mortality.

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