



## Original Research Article

# Clinical Profile of Emphysematous Pyelonephritis in Diabetics

Authors

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## Abstract

**Introduction:** *Emphysematous pyelonephritis is a rare but potentially life threatening necrotising renal parenchymal infection characterised by the production of intraparenchymal gas. It is exclusively found in Diabetic patients with a female pre ponderance. In the past, standard treatment was nephrectomy of the affected kidney. The situation has changed dramatically in recent years with CT scan based diagnosis and advancements in multidisciplinary intensive care of sepsis syndrome and MODS. Now the mortality rates has declined to 20%-25%.*

**Objectives:** *To study the clinical profile and etiology of emphysematous pyelonephritis among Diabetic patients*

**Materials and Methods:** *50 Diabetic patients with emphysematous pyelonephritis were studied. Clinical profile including etiology were studied.*

**Results:** *EPN was more in the elderly diabetics. 44% of the patients were above 65 years. Females constituted the majority (98%). E.Coli was the commonest organism isolated (78.9%) followed by Klebsiella. The overall survival rate was 90%.*

**Conclusions:** *EPN was more common in elderly female diabetics. The overall survival rate with medical treatment was good. Mortality was more in patients with bilateral EPN, thrombocytopenia, shock, renal failure and altered mental status.*

**Keywords:** *EPN. MODS.*

## Introduction

Emphysematous pyelonephritis is a rare but potentially life threatening necrotising renal parenchymal infection characterised by the production of intraparenchymal gas. It is exclusively found in Diabetic patients with a female pre ponderance. Klorfein and Schultz coined the term Emphysematous Pyelonephritis in 1962<sup>1</sup>. EPN is caused by enteric gram negative

facultative anaerobes<sup>2</sup>. E coli is isolated in 66% of patients and Klebsiella in 26% of patients. Mixed organisms are observed in 10% of patients. Rarely Fungi (*Aspergillus fumigates*, *Candida*) and Protozoa (*E. histolytica*) have been isolated in patients with EPN<sup>3,4</sup>. Rarely EPN has been reported in non diabetics. Obstruction is the main cause of EPN in persons without Diabetes

Untreated cases of EPN result in mortality. Huang and Tseng reported a mortality rate of 19%<sup>5</sup>. The mortality associated with the disease was high before the advent of antibiotics. However advances in imaging technology, diabetes control and minimally invasive treatment have improved patient outcomes. Percutaneous catheter drainage has demonstrated good success rate with low mortality. Although some patients may require subsequent nephrectomy. Factors associated with poor prognosis in EPN include altered level of consciousness, multi organ failure and uncontrolled diabetes<sup>6</sup>.

**Materials and Methods**

This was a hospital based cross-sectional study and the sample size was 50 patients. The study period was 1 year from August 2016 to July 2017

**Inclusion Criteria**

All Diabetic patients admitted with EPN

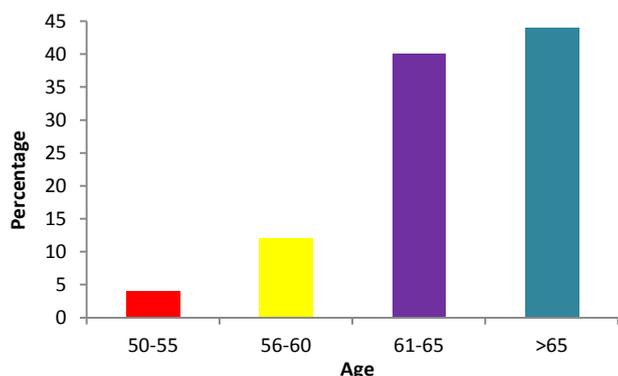
**Exclusion Criteria**

All Non diabetic patients with EPN

Data was collected using a proforma which contained variables. Statistical analysis was done using SPSS 22 Software. Ethical clearance was obtained from the institutional ethical committee.

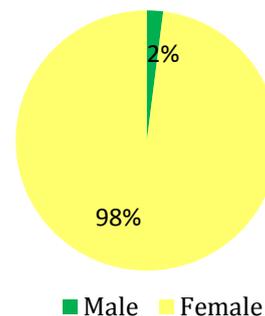
**Results**

In our study EPN was more common in the elderly. Out of the 50 patients studied 22 patients were above 65 years of age (44%), followed by 20 patients in the 61-65 age group (40%). Thus majority of the patients were above 60 years (84%). Fig (1)



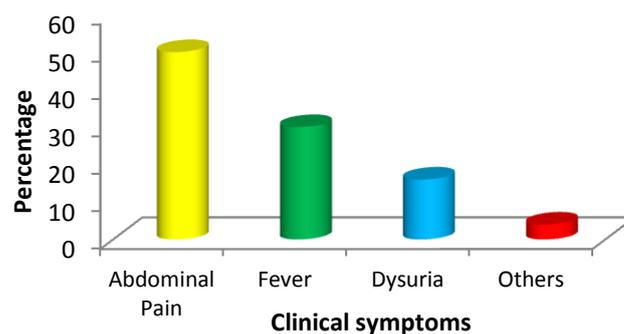
**Fig.1** Age wise distribution of study group

In our study EPN was more common in females. Ninety eight percent of the patients were females (Fig. 2). A definite female preponderance was observed.



**Fig.2** Sex wise distribution of study group

The commonest clinical presentation was abdominal pain followed by fever (Fig.3). Twenty percent patients presented with shock. Disorientation of mental status was observed in 2% patients.



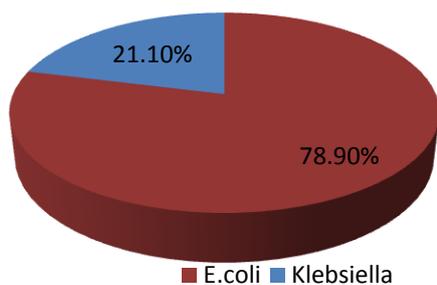
**Fig 3** Clinical Presentation Status

The urine cultures of 76% patients were tested positive. Among the culture positive patients E.coli was the organism isolated in 78.9% patients followed by Klebsiella. (Fig.4).

Thrombocytopenia, platelet count less than 75000 was observed in 20% of patients. (Table 1)

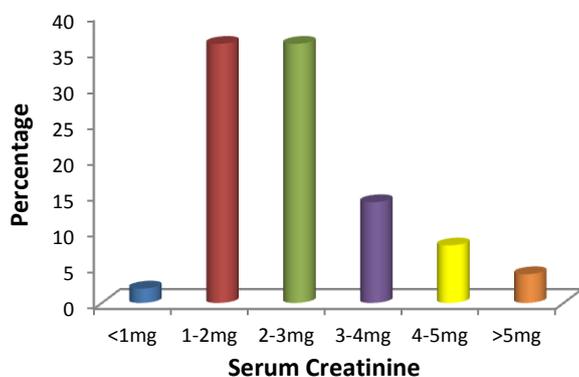
**Table 1** Platelet count of the study group

Platelet Count	No.of patients	Percentage
<50000	5	10
50000-75000	5	10
75000- 1 lakh	18	36
1-1.5 lakh	22	44



**Fig. 4** Organism distribution in Urine culture

With respect to renal function, S.Creatinine was normal in only 2% of patients, Majority (72%) had S.Creatinine in the range of 1-3 mg (Fig.5). Based on Huang and Tseng CT Scan grading only 6 patients (12%) were in grade 4.



**Fig 5** Serum Creatinine level in the study group

All the 50 patients were managed medically. None of the patients underwent any surgical procedure. 10% patients died during the course of treatment. Mortality was more (50%) in patients who presented in shock. There was statistical significance between mortality and shock. Mortality was also higher in patients with altered sensorium .83.3 percent of the patients with altered sensorium died. This was also statistically significant. Patients with bilateral EPN had 100% mortality.

**Discussion**

In this study it was found that as the age increases the incidence of emphysematous pyelonephritis also increases. Majority of the patients (84%) were above 60 years of age. This is consistent

with the observations by Fathima et al<sup>7</sup> in which the patients were in the age group 50-60yrs There was a definite female preponderance in this study with 49/ 50. This is also similar to the observations made by Fathima et al, where 72.7% were females.

Regarding clinical features abdominal pain (50%) and fever (30%) were the common presentations. This is similar to the observations made by Sohlak et al<sup>8</sup>. majority of patients (73%) had fever. Only 38 patients were culture positive (76%). E coli was isolated in 30 patients (78.9%) Fathima et al in her study also had similar observations. 14/17patients had E,coli as pathogen.

10 patients presented with shock (20%). Sokhal et al in their study had 16.2% of their patients presenting with shock. There was a statistically significant association of shock with mortality.

Serum Creatinine was another important risk factor. Majority (74%) had a S. Creatinine <3mg /dl. But Fathima et al in their study had only 36% of patients with S. Creatinine <3mg/dl. There was a statistically significant association of S. Creatinine values and mortality

There was a statistically significant association between thrombocytopenia and mortality.This is similar to the observations made by Ftahima et al Altered mental status was another important prognostic factor. There was strong statistical association between mortality and altered sensorium (p=0.000).This is also similar to the observations by Fathima et al

There was a statistically significant association of mortality with bilateral EPN (p=0.00)

**Conclusion**

Emphysematous pyelonephritis was more common in elderly Diabetics.

There was a definite female preponderance All the 50 patients took medical treatment only. The overall survival rate was 90%. There was strong association of mortality with patients presenting with shock, thrombocytopenia, altered renal function bilateral EPN and altered sensorium. This was statistically significant

Early diagnosis of emphysematous pyelonephritis by clinical suspicion and appropriate imaging will help a long way in reducing mortality

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