

# Clinical Characteristics and Outcomes of Patients with *Klebsiella pneumoniae* Visceral Organ Abscesses in Singapore

Shuwei Zheng, Helen May Lin Oh

Division of Infectious Diseases, Changi General Hospital, Singapore



Changi  
General Hospital

## INTRODUCTION

*Klebsiella pneumoniae* (KP) has emerged, in recent years, as the predominant microbiological aetiological agent of pyogenic liver abscesses.

KP, as the causative microorganism in other visceral organs, is less described despite its pathogenicity for tissue invasion. In this study, we seek to describe the clinical characteristics of patients with KP visceral organ abscesses in our institution.

## METHODS

A retrospective analysis of patients with culture-positive (blood or abscess aspirate) KP visceral organ abscesses from May 2015 to Apr 2016 requiring hospitalization in the Changi General Hospital, was conducted to evaluate their clinical characteristics and outcomes.

## RESULTS

During the study period, there were a total of 71 patients hospitalized with culture-proven KP visceral organ abscesses. 43 (60.6%) were males and 28 (39.4%) were females. The mean age of the patients was 64.4 years (range 32 to 98 years).

Diabetes mellitus was the commonest comorbidity and this was found in 40 (56.3%) patients.

- 5/40 (12.5%) patients presented with newly diagnosed diabetes.
- 6/40 (15.0%) patients presented with hyperglycemic crisis.
- 27 (67.5%) patients had their glycated haemoglobin (HbA1c) performed with a mean value of 9.3% (range 5.2% to 13.5%).

Other comorbidities include underlying biliary disease in 9 (12.7%) patients, malignancy in 7 (9.9%) patients and liver cirrhosis in 6 (8.5%) patients.

The commonest presenting symptom was fever, and this was noted in 57 (80.3%) patients. 50 (70.4%) patients had documented bacteremia.

Figure 1: Distribution of Visceral Organ Abscesses

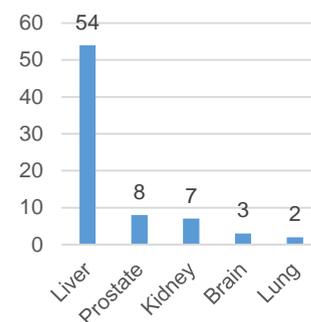
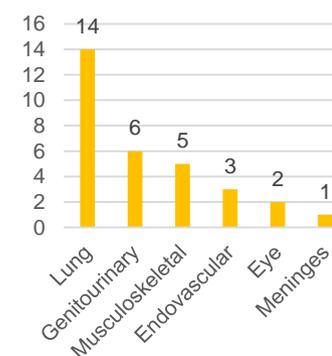


Figure 2: Distribution of Metastatic Sites



Distribution of the visceral organ abscesses are as shown in Figure 1.

- The commonest location is in the liver in 54/71 (76.1%) patients: location of the liver abscess(es) were right lobe in 26 (48.1%) patients, left lobe in 15 (27.8%) patients, both lobes in 13 (24.1%) patients.
- 4 patients had visceral organ abscesses over multiple sites.

24 (33.8%) patients had involvement of distant sites without abscess formation as shown in Figure 2.

- The commonest site of involvement without abscess formation is in the lungs in 14/24 (58.3%) patients.

The largest diameter of any abscess range from 1.3cm to 12.8cm (mean 5.8cm). The most common initial imaging modality used to diagnose the abscess in our institution was the computed tomography scan (59/71, 83.1%).

Figure 3: Antimicrobial Susceptibility

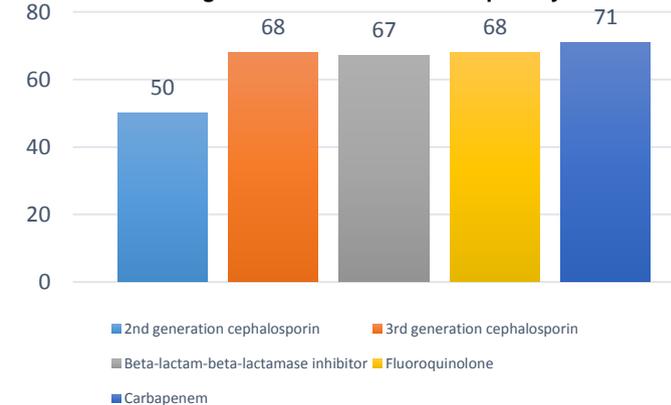
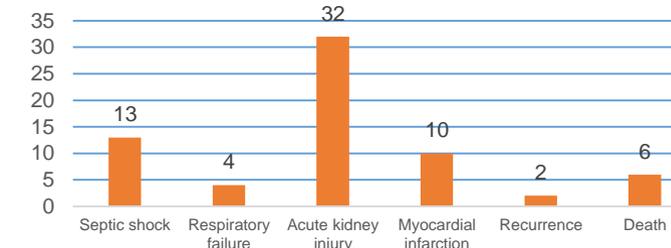


Figure 3 shows the antimicrobial susceptibility of the KP isolates based on disc diffusion methodology. 3/71 (4.2%) were extended spectrum beta-lactamase (ESBL) producers. All the non-ESBL strains were susceptible to fluoroquinolones and third generation cephalosporins. Susceptibility testing for second generation cephalosporins (cefuroxime at our institution) revealed that only 50/71 (70.4%) were fully susceptible (most were of intermediate susceptibility).

27/71 (38.0%) patients had their abscesses conservatively managed with systemic antimicrobial therapy alone whilst 44/71 (62.0%) patients had abscess drainage and systemic antimicrobial therapy. Amongst the 44 patients who underwent abscess drainage, majority (97.7%) were performed through radiological guidance.

The mean total duration of systemic antimicrobial therapy was 7.8 weeks (range, 0 – 18 weeks). The mean duration of parenteral antibiotics was 2.3 weeks (range, 0 – 8 weeks) and the mean duration of oral antibiotics was 5.2 weeks (range, 0 – 16 weeks). 68/71 (81.7%) patients had parenteral antibiotics switched to oral antibiotics eventually, while 13/71 (18.3%) had parenteral antibiotics only.

Figure 4: Complications and Outcomes of Patients with KP Visceral Abscesses



The commonest complication in our series was acute kidney injury, which occurred in 32/71 (45.0%) of patients. There were 6/71 (8.5%) deaths. Amongst survivors, recurrence rates was low at 3.1%.

## DISCUSSION & CONCLUSION

KP liver abscesses were first described in the 1980s in Taiwan. Consequently, KP emerged as the predominant cause of pyogenic liver abscess in various other countries in Eastern and Southeast Asia. In Taiwan, KP is also the leading microbiological cause of prostatic abscesses amongst diabetics. Till date, no study has attempted to characterize the distribution and clinical characteristics of patients with KP visceral organ abscesses.

Our study concludes that KP also causes visceral organ abscesses. The genitourinary tract is the commonest site outside of the liver. Early imaging of visceral organs is crucial in the management of septic patients with KP infections. Parenteral to oral switch of antimicrobial agents appear safe and effective.

### References:

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3. SC Wen, et al. Int J Infect Dis 2012;16(5):e344-9.