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Introduction

•*Klebsiella pneumoniae* bacteraemia is a major cause of morbidity and mortality in hospitals. Multidrug resistance associated with extended spectrum β lactamase and *K. pneumoniae* carbapenemase (KPC) organisms is a growing health threat. The purposes of this study is determine the demographic patterns, risk factors and outcome of *K. pneumoniae* bacteraemia in tertiary hospital in the Southern region of Malaysia.

Methods

•Single-center retrospective analysis involving all adults with *K. pneumoniae* bacteraemia in Sultan Ismail Hospital, Johor Bahru, Malaysia in 2016

•Data on demographic patterns , risk factors , medical comorbidities , source of infection and in hospital mortality were obtained from the electronic medical records

•24,143 adult admissions with 5714 blood culture samples collected , of which 1124 (19.7 %) were positive cultures

•825 blood culture samples met eligibility criterias . 299 samples were excluded as they were deemed clinically insignificant or contaminant

•Analysis of data performed using SPSS version 18. A p-value of <0.05 was considered statistically significant

Results

•Gram negative bacteraemia accounted for 69.2 % of total positive blood cultures .

•*Klebsiella pneumoniae* was the commonest blood-stream pathogen (185 cases, 22.4 %) followed by *Escherichia coli* (179 cases , 21.7 %) and *Staphylococcus aureus* (153 cases, 18.4 %) , *Streptococcus spp* (75 cases, 9.1 %) and *Acinetobacter spp* (42 cases, 5.1 %)

•Mean age was 54.9 (SD 15.4) with an overall in-hospital mortality rate of 46.5 % . Extended Spectrum Beta Lactamase (ESBL) producing and Carbapenem resistant *K. pneumoniae* accounted for 37.3% (n= 69) and 1.1 % (n= 2) cases respectively (Table 1)

Characteristic	Number (n = 185)	Percentage (%)
Gender		
Male	105	56.8
Female	80	43.2
Race		
Malay	120	64.9
Chinese	35	18.9
Indian	21	11.4
Others	9	4.9
Acquisition		
Community	65	35.1
Healthcare associated	41	22.1
Nosocomial	79	42.7
Resistant pattern		
ESBL <i>K.pneumoniae</i>	69	37.3
CRE	2	1.1

Table 1 Characteristics of patients with *K.pneumoniae* bacteraemia

Risk factor	Number (n)	Percentage (%)
Diabetes mellitus	95	51.4
Hypertension	53	28.6
Cancer	45	24.3
CKD/ ESRF	25	13.5
Heart disease	23	12.4
Stroke	16	8.6
Chronic liver disease	6	3.2
Others	26	14.1

Table 2 Risk factors for *K.pneumoniae* bacteraemia acquisition

•Diabetes mellitus (51.4%, p= 0.029) , cancer (24.3% , p= 0.001) and alcohol use disorder (4.0%, p=0.025) were significant risk factors for acquiring *K. pneumoniae* (Table 2)

Source of Infections of K.Pneumoniae Bacteraemia

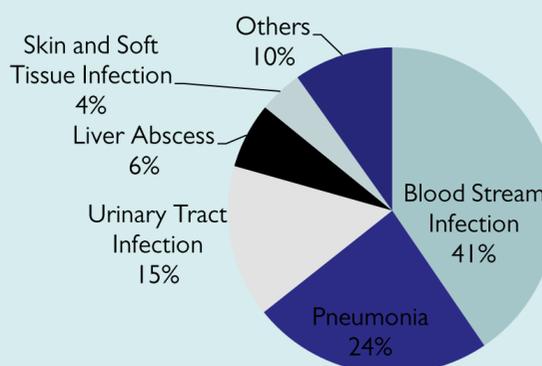


Chart 1 :- Sources of infection

•The common sources of *K. pneumoniae* bacteraemia were primary bloodstream infections (40.5 % , n=75) , followed by pneumonia (23.8%, n= 44) and urinary tract infection (15.1%, n=28) , liver abscess (6.5%, n=12) and skin and soft tissue infection (4.3 % , n=8) (Chart 1)

•Older age (p=0.005) and chronic liver disease (p= 0.008) were predictors of in-hospital mortality (Table 3)

Variables	Alive n=99	Deceased n=86	P value
Age, mean ± S.D, years	52.00 ± 16.352	58.29 ± 13.603	0.005
Comorbidities, n (%)			
Chronic Liver Disease	0	6 (7.0)	0.008
Cancer	30 (30.0)	15 (17.4)	0.042
Source of infection, n (%)			
Urinary System	21 (21.2)	7 (8.1)	0.013

Table 3 Chi-Square analysis of risk of mortality due to *K.pneumoniae* infection

Discussion

•Gram negative bacteraemia accounted for 69.2 % of total positive blood cultures , compared to a study conducted in a teaching hospital in Kuala Lumpur 2 decades ago which reported higher Gram positive bacteraemia (56.7 % of the blood cultures) (1)

•*K.pneumoniae* has surpassed *Escherichia coli* to become the predominant gram negative pathogen in our institution (22.4 % versus 21.7 %) .

•Multidrug resistance associated with extended spectrum β lactamase (37.3 %) and *K. pneumoniae* carbapenemase (1.1%) organisms is a growing health threat (2)

•Diabetes mellitus , cancer and alcohol use disorders were risk factors associated with *K. pneumoniae* bacteraemia similar to previous reported study (3).

•Overall in-hospital mortality rate of 46.5 % , similar to other reported study (4) . Older age and chronic liver disease were associated with higher mortality rate

Conclusion

•Diabetes mellitus , cancer and alcohol use disorders were independent risk factors associated with *Klebsiella pneumoniae* bacteraemia.

•Higher mortality rate was observed in elderly and patients with chronic liver disease.

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