27th ECCMID Vienna, Austria 22 – 25 April 2017
The congress of ESCMID

Session: P093 Bloodstream infections: epidemiology and management

Category: 2b. Severe sepsis, bacteraemia & endocarditis

25 April 2017, 12:30 - 13:30
P1954

Klebsiella pneumoniae carbapenemase - producing K. pneumoniae (KPC - Kp) bloodstream infections: a case study of a tertiary care university hospital in Italy

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Background: In the last decade the spread of strains of Klebsiella Pneumoniae Carbapenemases (KPC) producing *K. pneumoniae* (Kp) increases dramatically and has become a significant problem in terms of public health and clinical outcome. It is noteworthy that some authors highligthed an increased incidence in KPC-Kp infections in medical and surgical wards compared with intensive care units (ICU).

Material/methods: In this retrospective observational study, conducted in the Italian teaching Hospital of Pisa, were enrolled 73 patients with a bloodstream infections (BSI) caused by KPC-producing Kp isolates (KPC-Kp) diagnosed between 1 January 2012 and 31 December 2015. In addition to a descriptive analysis, we compared patients who developed a KPC-KP BSI admitted in ICU with those in internal or surgical wards.

Results: Demographics, main clinical characteristics, comparison between two study groups, and outcome of study population are summarized in Table 1. Septic shock, SOFA score, prior surgical surgery, presence of invasive devices, necessity of organ supports were significantly higher in ICU, meanwhile Charlson Score, was higher in medical or surgical wards. There were no significant differences in the empirical and targeted therapies, as well as in combination therapies, in both groups

Conclusions: KPC-KP BSI are associated with high mortality (overall 30 days mortality rate of 50,7%). In our study, the mortality rate among patients with KPC-Kp BSI admitted in ICU or medical or surgical wards was not significantly different, despite admission in ICU is a well-known factor for mortality. Probably, the major burden of comorbidity in patients admitted in medical or surgical wards compared with those in ICU balanced the major severity of the infection and organ dysfunctions present in the latter subgroup. Comorbidities and the patient's fragility are not modifiable mortality risk factors, therefore remains fundamental to preventing and controlling the spread of infection with the adoption of antimicrobial stewardship programs.

Variables	Patients (n=73)	ICU (n=46)	Medical or surgical wards (n=27)	p
Age (years)	65,60 ± 14	64 ± 14	68,5 ± 13	ns
Previous admission(s) (30 days)	31/73 (42,5%)	14/46 (30,4%)	17/27 (63%)	**<0,05**
Hospital stay (days)	45 [23 - 67,50]	44 [8-112]	30 [10-95]	ns
SOFA (1 days)	8,11 ± 4,6	9,59 ± 4,489	5,24 ± 3,390	**<0,001**
Charlson score	4,45 ± 2,53	3,74 ± 2,092	5,67 ± 2,78	**<0,05**
Prior surgical procedures	45/73 (61,7%)	36/46 (78,3%)	8/27 (29,6%)	**<0,001**
Invasive procedures	66/73 (90,4%)	45/46 (97,8%)	21/27 (77,8%)	**<0,05**
Septic Shock	34/73 (46,6%)	27/46 (58,7%)	7/27 (25,9%)	**<0,05**
30-day mortality	37/73 (50,7%)	23/43 (50%)	14/27 (51,9%)	ns