

P1979 **Breakthrough bloodstream infections among critically ill non-neutropenic patients: high incidence and better survival as compared to non-breakthrough**

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Background: Breakthrough bloodstream infections (BSIs) were usually reported among neutropenic patients. The aim of the present study is to determine the risk factors associated with development of breakthrough BSIs among critically ill non-neutropenic patients and their role on mortality.

Materials/methods: During a 12 month period (August 2016 to July 2017), all bloodstream infections among patients hospitalized at the ICU of the University General Hospital of Patras, Greece were included. Antimicrobial resistance of isolates was interpreted according to EUCAST guidelines. BSI were considered as breakthrough when blood cultures yielded a pathogen in a patient who, for at least the previous 96 hours, had been receiving at least one antibiotic to which the isolated microorganism was susceptible.

Results: Among 100 patients that developed a BSI during the study period, 57 (57%) developed a breakthrough BSI. Primary BSIs represent the majority of BSIs (57%) followed by catheter-related (24%) and urinary-tract (8%). The majority of isolated pathogens were Gram-negative bacteria (n=77) (Table). Factors associated with development of breakthrough BSI as compared to non-breakthrough was diabetes (P 0.025), administration of corticosteroids during ICU stay (P 0.002), BSI caused by Gram-positive bacteria (P 0.007) and appropriate empiric antibiotic administration (P 0.013). Fourteen-day mortality was 22%. Mortality was associated with higher SAPS score (P 0.001), whereas breakthrough BSIs (P 0.009), and appropriate empiric antibiotic administration (P 0.045) were associated with better survival. No difference among age, comorbidities and severity scores upon admission or upon onset of infection was detected among patients with breakthrough and non-breakthrough BSIs.

Conclusions: Breakthrough BSIs are common among critically ill non-neutropenic patients. Even though patients with breakthrough BSI were equally ill to those without, they were associated with better survival since they were *de facto* receiving appropriate antibiotics.

Species	Non-breakthrough BSI (n=43)	Breakthrough BSI (n=57)
Gram-positive bacteria	4(9.3%)	14(24.6%)
<i>S. epidermidis</i>	1(2.3%)	9(15.8%)
<i>S. aureus</i>	2(4.7%)	1(1.8%)
Enterococci	1(2.3%)	3(5.2%)
Other	0(0.0%)	2(3.5%)
Gram-negative bacteria	38(88.4%)	39(68.4%)

<i>K. pneumoniae</i>	21(48.8%)	17(29.8%)
<i>Acinetobacter</i> spp.	12(27.9%)	12(21.1%)
<i>P. aeruginosa</i>	6(14.0%)	11(19.3%)
Other	2(4.7%)	1(1.8%)
<i>Candida</i> spp.	4(9.3%)	9(15.8%)
<i>C. albicans</i>	1(2.3%)	2(3.5%)
<i>C. non-albicans</i>	3(7.0%)	7(12.3%)
Polymicrobial	6(14.0%)	8(14.0%)