The Brazilian Journal of
INFECTIOUS DISEASES
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Letter to the Editor

Estimating risk factors for acinetobacter bacteremia in pediatric settings

Dear Editor,

Nosocomial invasive infections due to *Acinetobacter* species are gradually increasing in the health care settings especially in intensive care units (ICUs).[1]

This retrospective study is designed to investigate risk factors associated with *Acinetobacter* bacteremia among children hospitalized in Dr. Behçet Uz Children's Hospital, during 2005–2011. Nosocomial bacteremia was defined as isolation of *Acinetobacter* spp. obtained from blood 72 h after admission to the hospital in the presence of infection. The control group was randomly recruited from the age-matched patients who had no fever or clinical deterioration after the hospitalization more than 72 h.

Identification of *Acinetobacter* spp. in blood samples was performed using a Bact-Alert (bioMérieux, France) automated system. Susceptibility of the isolates by determination of the minimum inhibitory concentrations was performed by VITEK2 (bioMérieux, France) compact system.

Table 1 – Cases of bacteremia × control cases (non-bacteremia).

Characteristics	Cases of bacteremia with *Acinetobacter*	Control cases (non-bacteremic)	*p*
	(*n* = 35)	(*n* = 70)	
Demographic parameters			
Age, months, median (IQR)	7 (1–172)	4.5 (1–169)	0.95
Male gender, *n* (%)	21 (60)	34 (48.6)	0.26
Concomitant illness, n (%)			
Prematurity	10 (28.6)	21 (30)	0.88
Neurometabolic diseases	10 (28.6)	6 (8.6)	**<0.01**
Hematologic malignancy	4 (11.4)	2 (2.9)	0.09
Congenital cardiac disease	3 (8.6)	11 (15.7)	1
Chronic lung disease	2 (5.7)	4 (5.7)	1.00
Renal insufficiency	2 (5.7)	4 (5.7)	1.00
Immunosuppressive status	4 (11.4)	9 (12.9)	1.00
Neutropenia	5 (14.3)	6 (8.6)	0.50
Duration (days), median (IQR)			
Of hospitalization	24 (6–359)	16 (3–169)	**0.01**
From hospitalization to bacteremia	13 (4–288)	11 (3–282)	0.62
Invasive procedures, n (%)			
Urinary catheter	3 (8.6)	5 (7.1)	1.00
Central venous catheter	6 (17.1)	2 (2.9)	**0.01**
Nasogastric tube	19 (54.3)	23 (32.9)	**0.03**
Mechanical ventilation	14 (40)	21 (3.0)	0.30
Thoracic drainage	2 (5.7)	2 (2.9)	0.59
Peritoneal dialysis	1 (2.9)	1 (1.4)	1.00
Major surgery	3 (8.6)	1 (1.4)	0.10
Prolonged antibacterial use >10 days, n (%)	18 (51.4)	50 (71.4)	0.05
Prolonged hospital stay >20 days, n (%)	24 (68.6)	30 (42.9)	**0.01**
Mortality rates, n (%)	11 (31.4)	20 (28.6)	0.76

The χ^2 and Fisher's exact test were used to evaluate the association between categorical quantitative variables and Student's *t*-test or Mann–Whitney-*U* test for continuous variables.

A total of 35 patients and 70 control patients without bacteremia were included in this retrospective case–control study. The patients had the following diagnosis: primary bacteremia 9 (25.7%), pneumonia 9 (25.7%), central-catheter related infection 7 (20%), peritonitis, urinary tract infection, cerebrospinal fluid infection, and post-burn wound infection.

There was no significant difference in terms of gender, age, prior history of hospitalization or concomitant illness except underlying neurometabolic disease ($p > 0.05$). Length of hospital stay was statistically higher in patients with bacteremia than in control patients [24 days (6–359) for patients, 16 days (3–169) for controls ($p = 0.01$)]. Further analysis indicated that presence of central venous catheter, nasogastric tube, prolonged use of antibiotics, hospitalization for >10 days, and concomitant neurometabolic disease ($p < 0.05$) were significantly more frequent among patients compared to the control group ($p < 0.05$) (Table 1).

Risk factors of mortality in *Acinetobacter* bacteremia are male gender, prior use of carbapenems and glycopeptides antibiotics, mechanical ventilation and gentamicin resistance of the isolate.

Several studies reported the risk factors for *Acinetobacter* bacteremia especially in ICUs. Among these studies, length of stay in ICU, previous use of antimicrobials, mechanical ventilation, male gender, neurologic impairment, prior colonization, and presence of excess intravascular devices were found to be independent risk factors for bacteremia.[2–5] In our study, the ratio of children having central venous catheter, nasogastric tube and concomitant neurometabolic disease were found to be higher compared to control group. Plus the *Acinetobacter* group was found to have longer length of hospitalization and longer antibiotic usage, compared to control group ($p > 0.05$).

Central venous catheter and nasogastric tube insertions were found to be risk factors for bacteremia. Central venous catheterization was inserted in 17.1% of the patients with *Acinetobacter* bacteremia, and in only 2.9% of the control group ($p = 0.01$).

In conclusion central venous catheter insertion, long length of stay, prolonged use of antibiotics, and concomitant neurometabolic disease were risk factors for the presence of bacteremia. Male gender, prior use of carbapenems and glycopeptides antibiotics, use of mechanical ventilation and gentamicin resistance of the isolates were also found to be risk factors of mortality in *Acinetobacter* bacteremia.

Conflict of interest

The authors declare no conflict of interest.

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Received 6 December 2012
Accepted 15 February 2013

Available online 27 June 2013

1413-8670

http://dx.doi.org/10.1016/j.bjid.2013.02.003