



Risk factors for the mortality in candidemia cases

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Introduction

The incidence of candidemia has significantly increased worldwide, representing an important complication in hospitalized patients, particularly in intensive care units and hematology-oncology departments. The use of wide-spectrum antibiotics or corticosteroids, aggressive chemotherapy, invasive interventions, and parenteral alimentation increase the risk of candidiasis in hospitalized patients. Although, the advances achieved in the diagnosis and treatment of invasive candidiasis, it is a still leading cause of crude and attributable mortality in hospital settings. The aim of this study was to describe the risk factors for mortality secondary to candidemia episodes at Gazi university Hospital during the 2006-2012 period.

Materials and Methods

All candidemia cases between 2006 and 2012 were included in the study. The data were collected from patients files and infection control committee records and analyzed retrospectively. A diagnosis of candidemia was made on the basis of ≥ 1 blood cultures growing *Candida* species and the presence of relevant clinical signs and symptoms. Only the first episode of candidemia was reported for patients with recurrent or subsequent episodes of infection. The risk factors for the mortality were compared between fatal and survived groups. Fisher's exact test or χ^2 test, as appropriate, was used for testing associations between categorical patient characteristics and *Candida* species.

Results

Candidemia was detected in 267 patients. Mortality was seen in 142 of the patients (53.2%). In a univariate analysis, stay in ICU, hemodialysis, mechanical ventilation, urinary catheterization, diabetes mellitus and total parenteral nutrition, an accompanying infection (especially ventilator associated pneumonia) were found to be significant risk factors for the mortality (Table 1). A presence of infection in other sites due to *Acinetobacter baumannii* and *Candida* species were related to higher mortality rate. Interestingly, presence of neutropenia was related to lower mortality rate in this study.

Table 1. Univariate analysis of risk factors in 267 patient of Nosocomial *Candida* blood stream infections according to mortality

Characteristic	No. (%) of <i>Candida</i> bloodstream infections			p
	Mortality 142 (53.2)	Survived 125 (46.8)	Total 267 (100)	
Setting, ICU	117 (82.4)	52 (41.6)	169 (63.2)	0.000
Male/female	75/67	65/60	140/127	
Age				
Underlying diseases / risk factors				
Neutropenia	4 (2.8)	18 (14.4)	22 (8.2)	0.001
Malignancy	31 (21.8)	39 (31.2)	70 (26.2)	0.095
Immunosuppressive therapy	34 (23.9)	33 (26.4)	67 (25)	0.673
Tracheostomy	29 (20.4)	14 (11.2)	43 (16.1)	0.046
Hemodialysis	21 (14.7)	4 (3.2)	25 (9.3)	0.001
Mechanical ventilation	116 (81.6)	55 (44)	171 (64)	0.002
Central venous catheter	125 (88)	104 (83.2)	229 (85.7)	0.294
Urinary catheter	124 (87.3)	58(46.4)	182 (68.1)	0.001
Diabetes mellitus	29 (20.4)	9 (7.2)	38 (14.2)	0.003
H2 antagonist/antacid	124 (87.3)	91 (72.8)	215 (80.5)	0.003
Total Parenteral Nutrition	91 (64)	51 (40.8)	142 (53.2)	0.001
Endoscopy	53(37.3)	36(28.8)	89 (33.3)	0.154
Accompanying Type of infection				
None	34 (23.9)	66 (52.8)	100 (37.4)	0.001
upper respiratory tract infection (including VAP*)	53 (37.2)	21 (16.8)	74(27.7)	0,002
Bloodstream infection	16 (11.2)	13 (10.4)	29 (10.8)	0.978
Urinary tract infection	31 (21.8)	17 (13.6)	48 (17.9)	0.110
Other infection **	8 (5.6)	8 (6.4)	16 (5.9)	0.992
Accompanying microorganisms				
None	36(25.3)	67(53.6)	103(38.5)	0.0000
<i>Acinetobacter</i> spp	43(30.2)	12(9.6)	55(20.5)	0.0003
<i>Pseudomonas</i> spp	11(7.7)	12(9.6)	23(8.6)	0.747
<i>Candida</i> spp	33(23.2)	13(10.4)	46(17.2)	0.008

*ventilator-associated pneumonia

**Surgical site infection and skin-soft tissue infection and Central nervous system infection

Conclusions

- Candidemia was observed mostly in intensive care units and resulted in higher mortality rate in our study.
- Presence of an invasive procedures, such as hemodialysis, mechanical ventilation, urinary catheterization, diabetes mellitus and total parenteral nutrition, were associated with higher mortality rates.
- In neutropenic patients, mortality was lower, maybe due to early initiation of empirical antifungal therapy in this patient group.
- Due the lack of early diagnostic methods and presence numerous of confounding factors in ICU patients cause to delay for antifungal therapy and lead to death in candidemia cases.