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侵袭性真菌感染 主题研讨会

The Asia IFI forum agenda



会议资料





侵袭性真菌感染主题研讨会日程

时间:2008年11月7日 下午13:30-17:30 地点:怡生园国际会议中心 会议官方语言:英语

大会主席: 北京大学临床药理研究所 肖永红教授
中国医科大学附属第一医院感染科 陈佰义教授

- 13:30-13:40 开幕词
- 13:40-14:10 侵袭性念珠菌和曲霉菌感染的流行病学及治疗 美国感染性疾病专家 Dr.Sanjay G. Revankar
- 14:10-14:35 抗真菌感染的经验治疗 北京大学血液病研究所 黄晓军教授
- 14:35-15:00 抗真菌药敏试验研究进展 北京大学真菌和真菌病研究中心 李若瑜教授
- 15:00-15:20 提问及讨论
- 15:20-15:40 茶歇
- 15:40-16:05 从宿主因素和主要临床症状探讨真菌感染的早期诊治 第二军医大学附属长征医院急救科ICU 陈德昌教授
- 16:05-16:30 米卡芬净治疗侵袭性非白念珠菌感染的临床研究 台北医科大学万芳医学中心感染科 李文生教授
- 16:30-16:55 抗真菌药物的安全性 复旦大学附属华山医院感染科 朱利平教授
- 16:55-17:15 提问及讨论
- 17:15-17:30 闭幕致辞

The Asia IFI forum agenda

Official language: English Place: Eastern Garden International Conference Center Data: Nov.7 (Fri.) 13:30-17:30

Chairman:

Dr.Xiao Yonghong Institute of Clinical Pharmacology, Peking University

Dr.Chen Baiyi Department of Infectious Disease ,the First Affiliated Hospital of China Medical University

- 13:30-13:40 opening speech
- 13:40-14:10 Epidemiology and Management of Invasive Candidiasis and Aspergillosis
Dr.Dr.Sanjay G. Revankar Division of Infectious Diseases,Wayne State University,Harper University Hospital
- 14:10-14:35 Talk Antifungal,Talk Empirical
Dr. Huang Xiaojun Beijing University Hematological Institute
- 14:35-15:00 Recent Advances of Antifungal Susceptibility Testing
Dr.Li Ruoyu Department of Dermatology, Peking University First Hospital; Research Center for Medical Mycology
- 15:00-15:20 Q&A
- 15:20-15:40 Tea break
- 15:40-16:05 Early diagnosis and treatment of fungal infections based on host factors and clinical symptoms
Dr.Chen Dechang Department of Medical Intensive Care Unit,Changzheng Hospital,the Second Military Medical University
- 16:05-16:30 Micafungin in non-albicans invasive candidiasis
Dr.Lee Wen-Sen Section of Infectious Disease,Department of Medicine,Taipei Medical University-Wan Fang Hospital
- 16:30-16:55 Safety of Antifungal Therapy
Dr. Zhu Liping Department of Infectious Disease,Huashan Hospital,the Affiliated hospital of Fudan University
- 16:55-17:15 Q&A
- 17:15-17:30 Close speech

Micafungin in non-albicans invasive candidiasis

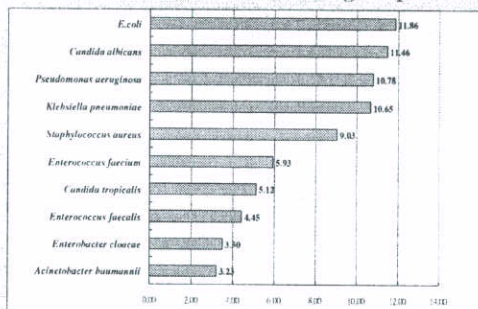
Dr. Wen-Sen Lee
Chief of infectious disease
Municipal Wan-Fang Hospital
Taipei Medical University

Trend of Pathogens in Hospital Setting.

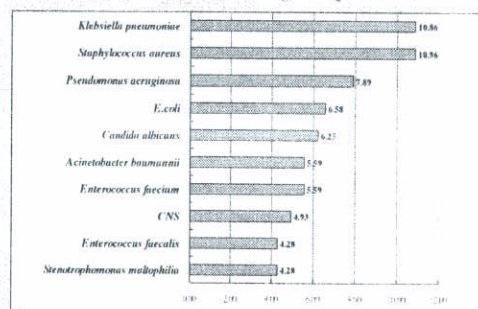
- Gram negative bacteria are still the most common (about 50-60 %) in the last decade..
- But the GPC and fungal infections(Candida, aspergillus) are increasing in recent years.
- Solid organ transplantation, B.M transplantation, chemotherapy, ICU patients and invasive procedure & device are the predisposing factors.

Clin Infect Dis. 2005; 41: 1455-60

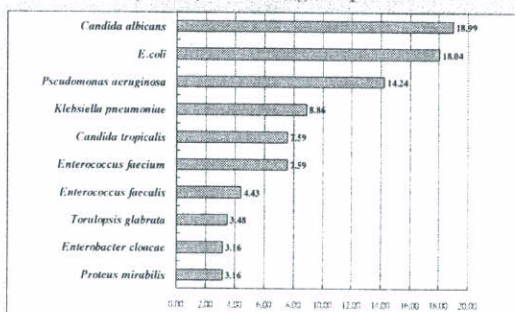
The 10 Most Frequently Isolated Pathogens Causing Nosocomial Infection in Wan-Fang Hospital 2007



Ranking of Major Pathogens Causing Nosocomial Infection by BSI, Wan-Fang Hospital 2007



Ranking of Major Pathogens Causing Nosocomial Infection by UTI, Wan-Fang Hospital 2007



Invasive Candida Infections

- Invasive candidiasis are an important causes of morbidity and mortality in hospitalized patients.
- Candidemia mortality rate may be as high as 47 % , although it is estimated to be 15% - 25 % for adults.

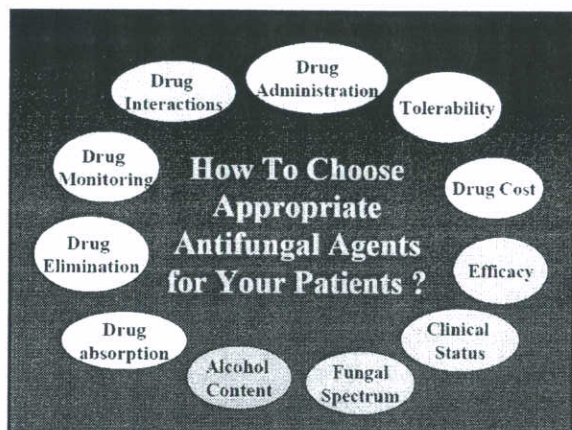
The changing face of fungal infections in Health care setting.
CID 2005; 41: 1455-60

Common fungal infections

- Yeast:
 - 1.candida spp
 - 2.cryptococcus
- Mold:
 - 1.aspergillosis
 - 2.mucormycosis
 - 3.fusarium

Clinical manifestations of candida infections

- Oral or esophageal candidiasis
- Fungemia or candidemia
- Hepato-spleno candidiasis
- Funguria (candiduria) : fungal UTI
- Cutaneous candidiasis
- Others: pulmonary or peritoneal candida infections



Treatment of Invasive Candidiasis

- FDA approval for treatment of invasive candidiasis, including conventional and lipid formulations of Amph-B , fluconazole, voriconazole ,caspofungin , anidulafungin, and micafungin.

Guidelines for treatment of candidiasis -CID 2004 ;38: 161-89
Drugs 2007; 67: 269-96
CID 2006; 43: 215-22

Treatment of Invasive Candidiasis

- In the treatment of candidemia , the echinocandins have demonstrated consistent efficacy and a favorable safety profile.

N Engl J Med 2007 ;356: 2472-82
N Engl J Med 2002 ;347: 2020-9

Indications of Micafungin

- Treatment of esophageal candidiasis above 16 years old
- Prophylaxis of *Candida* infections in patients undergoing hematopoietic stem cell transplantation
- Treatment of Patients with Candidemia and Other Candida Infections

Dosage of Micafungin

Indication	Recommended Dose* (mg per day)
Treatment of esophageal candidiasis	150
Prophylaxis of <i>Candida</i> infections in patients undergoing hematopoietic stem cell transplantation	50
Treatment of Patients with Candidemia and Other <i>Candida</i> Infections	100

Cost / Daily Cost

	Daily Dose	Daily Cost
Micafungin NT\$1,962/50 mg	50 mg - 150 mg	
	1,962	5,886
Diffucan® NT\$611/100 mg	400 mg - 900 mg	
	2,444	4,855
Vfend® NT\$4,894/200 mg	400 mg - 600 mg	
	9,788	14,652
Cancidas® NT\$9,500/50 mg	70 mg - 50 mg	
	13,300	9,300
Antibioomer NT\$6,641/50 mg	150 mg - 250 mg	
	19,923	13,205

Base on BNHI and Taiwan IDS guideline

Clinical efficacy of micafungin for treatment of non-albicans candidemia

■ Study design :

This was a prospective observational study in 750 beds medical center in Taipei- Municipal Wan-Fang Hospital .

In this study we sought to identify the efficacy of Micafungin in risk factors and outcome of critically ill patients .



Patients and Methods

- Study period : January 2007 to August 2008.
- There were 20 patients with non-albicans candidemia were included.
- Patients received 100 mg of micafungin once daily intravenously.
- The maintenance dosage of micafungin was adjusted to 50 mg daily for patients with moderate hepatic insufficiency ,defined as a Child-Pugh score of 7-9.

Patients and Methods

- There was no dosage adjustment for patients with renal dysfunction.
- Micafungin were administered for 14- 28 days, in patients with chronic disseminated candidiasis or candida endophthalmitis, for up to 8 weeks.
- In general , study medication for 14 days after last candida - positive blood culture and resolution of symptoms attributable to invasive candidiasis.
- Repeat blood culture every 5-7 days during therapeutic period , until negative blood culture for 2 sets each separate 24 hours.

Patients and Methods

- In our hospital , the infection control policy were : Fluconazole and Amph-B were as the first choice for C.albican infections , The other non-albicans candidiasis may received echinocandins ,itraconazole and voriconazole .
- Patients were permitted to switch to oral fluconazole therapy (400 mg daily) after a 14 days of intravenous therapy, except: candida infections were due to C.krusei or C.glabrata, neutropenia, clinical S/S had resolved.

Inclusion criteria

- Candidemia cases:
- Patients aged ≥ 18 years and diagnosed as candidemia , defined as at least 1 blood culture positive for non-albicans organisms.
- In addition, patients had fever ≥ 38 °C or hypothermia ≤ 36 °C, hypotension (SBP ≤ 90 mmHg ,local signs and symptoms of inflammation , and/or radiologic findings that suggested invasive candidiasis.

Assessment

- Antifungal prophylaxis with an azole or systemic amph-B was allowed prior to enrollment, independent of dose , duration, and route of administration.
- Clinical signs and symptoms were assessed at baseline, during therapeutic period, and 30 days after the end of all antifungal therapy.
- The investigator assess the clinical and mycological outcome and to assess all death.

Exclusion criteria

- Patients were not eligible for enrollment if :
 - 1.pregnant
 - 2.had liver cirrhosis with a Child-Pugh C : score of > 9 .
 - 3.had candida endocarditis, osteomyelitis, or meningitis.
 - 4.receipt of an echinocandin < 1 month.

Evaluation of efficacy

- Treatment success was defined as clinical and mycological success at the end of intravenous therapy of micafungin.
- For patients with candidemia, mycological success was defined as eradication if 2 cultures of blood specimens obtained at least 24 h apart had negative results.
- Treatment failure : progression of disease, mycological persistence , or death.

Demographic and clinical characteristics of population

- Total cases : 20
- Gender : Male : Female = 10 : 10
- APACHE II score : 15-20: 14, 20-25 : 6
- Age
 - Mean : 70.8 (42~94)
 - Median : 72.5 (42~94)
- Duration of anti-fungal therapy
 - Range: 3~30 days · Average : 16.4 days
- Dosage of Micafungin
 - 100 mg IV QD

		Disease	Specimen	Pathogen	Duration of therapy (days)
1	Female 80 y/o	CHF resp failure Pneumonia, UTI	Blood	<i>C. tropicalis</i>	21
			Urine	<i>C. tropicalis</i>	
2	Female 68 y/o	MR, TR & CHF pul edema & resp failure Pneumonia, UTI renal impairment	Blood	<i>C. tropicalis</i>	14
			Urine	<i>C. tropicalis</i>	
3	Female 70 y/o	Acute atelectasis oculofacial disease s/p graft in place renal impairment asp pneumonia Bacteremia with MRSE, UTI	Blood	<i>C. parapsilosis</i>	30
			CVC tip	<i>C. parapsilosis</i>	
4	Female 73 y/o	PPU s/p op with peritonitis pneumonia renal impairment DM, COPD TPN	Blood	<i>C. parapsilosis</i>	21

		Disease	Specimen	Pathogen	Duration of therapy (days)
5	Male 84 y/o	Uremia & CAPD with Peritonitis, pneumonia DM foot infection, PAOD & gangrene cellulitis	Blood	<i>C. tropicalis</i>	14
			Aspirates	<i>C. tropicalis</i>	
6	Male 68 y/o	T cell lymphoma s/p chemotherapy Pancytopenia. Oro-esophageal candidiasis, TPN	Blood	<i>C. tropicalis</i>	14
			oral & esophageal	<i>C. Tropicalis</i> <i>C. albican</i>	
7	Male 42 y/o	endocarditis IE s/p MVR AVR BIC Hemophilus aphrophilus bacteremia mediastinitis	Blood	<i>C. tropicalis</i>	14
			Wound	<i>C. tropicalis</i>	
8	Male 94 y/o	CHF, COPD & steroid pneumonia → P. aeruginosa Bacteremia with P. aeruginosa UTI → Yeast	Blood	<i>C. krusei</i>	14
			Urine	<i>C. krusei</i>	

		Disease	Specimen	Pathogen	Duration of therapy (days)
9	Female 79 y/o	Uremia (CRF) & CHF UTI → E. coli Septic shock S. aureus bacteremia No vegetation of valve, abdominal aorta aneurysm B.M biopsy revealed Hemophagocytosis, and pancytopenia CVII, TPN	Blood	<i>C. parapsilosis</i>	3 days death pul edema septic shock cardiogenic shock CVC in place
			CVC tip	<i>C. parapsilosis</i>	
10	Female 72 y/o	Adeno CA of lung & bone metastasis Duodenal ulcer & portal obs Reflux esophagitis TPN G-jejunostomy MRSE bacteremia	Blood	<i>C. glabrata</i>	30
			Urine	<i>C. glabrata</i>	
11	Female 74 y/o	DM severe AR MR & CHF 2° AV block renal impairment bacteremia with S. Marcescens	Blood	<i>C. glabrata</i>	14
			CVC tip	<i>C. glabrata</i>	

		Disease	Specimen	Pathogen	Duration of therapy (days)
12	Female 59 y/o	tongue CA s/p op & tongue base & epiglottis recurrence pneumonia & resp failure on ventilator cellulitis of neck port-A infection CVC tip: MRSA and MRSA bacteremia renal impairment	Blood	<i>C. glabrata</i>	21 days death septic shock due to fungemia & MRSA bacteremia Cachexia Port-A in place
			Port-A CVC tip	<i>C. glabrata</i> <i>C. parapsilosis</i>	
13	Female 78 y/o	Rectal CA & liver metastasis s/p op, stage 4 cachexia TPN UTI: P. aeruginosa	Blood	<i>C. parapsilosis</i>	14
			CVC tip	<i>C. Parapsilosis</i>	
14	Female 45 y/o	resp failure & ventilator Fungal UTI, pneumonia C-spine injury & paralysis Foley catheter	Blood	<i>C. glabrata</i>	21
			Urine	<i>C. glabrata</i>	

		Disease	Specimen	Pathogen	Duration of therapy (days)
15	Male 67 y/o	Pneumonia & resp failure COPD & steroid Tx Fungal UTI	Blood	<i>C. tropicalis</i>	14
			Urine	<i>C. tropicalis</i>	
16	Female 55 y/o	Colon CA s/p op Complicating leakage with peritonitis TPN	Blood	<i>C. tropicalis</i>	14
			Aspirates	<i>C. tropicalis</i>	
17	Male 68 y/o	COPD & steroid Tx Pneumonia & resp failure UTI Ileus TPN	Blood	<i>C. tropicalis</i>	18
			CVC tip	<i>C. tropicalis</i>	
18	Male 76 y/o	PPU s/p op with Peritonitis TPN COPD & resp failure	Blood	<i>C. parapsilosis</i>	14
			CVC tip	<i>C. parapsilosis</i>	

		Disease	Specimen	Pathogen	Duration of therapy (days)
19	Male 86 y/o	Parkinson disease Aspiration Pneumonia COPD & respiratory failure Bacterial UTI Fungal UTI	Blood	<i>C. glabrata</i>	16
			Urine	<i>C. glabrata</i>	
20	Male 78 y/o	Leukemia s/p C/T WBC=2000 B.M biopsy Pancytopenia MRSA bacteremia Pneumonia & resp failure TPN Mucositis Fungal UTI	Blood	<i>C. krusei</i>	7 days Death Septic shock due to fungemia and bacteremia CVC in place
			Urine	<i>C. krusei</i>	

Underlying Disease

	cases (n)	proportion (n/20*)%
Respiratory failure	9	45%
Renal disease (renal insufficiency)	7	35%
Heart disease(CAD and heart failure)	6	30%
COPD	6	30%
Cancer	6	30%
Hallow organ perforation or leakage	4	20%
Diabetes mellitus	3	15%
Vascular disease	3	15%
Peptic ulcer	1	5%
Parkinson disease	1	5%
C-spine injury & paralysis	1	5%

Risk Factors

	Cases (n)	Proportion (n/20*)%
Antibiotic exposure \geq 7 days	20	100%
Central venous catheter in place	18	90%
Total parenteral nutrition	8	40%
Preexisting candiduria	8	40%
Immunosuppressed Agent or chemotherapy	8	40%

Co-morbid Bacterial Infectious Disease

	cases (n)	Proportion (n/20*)%
Pneumonia	12	60%
Bacteremia	8	40%
UTI	7	35%
Peritonitis	4	20%
Cellulitis	3	15%

Candida species distribution in non-albican candidemia

	cases (n)	Proportion (n/20*)%
C. tropicalis	8	40%
C. parapsilosis	5	25%
C. glabrata	5	25%
C. krusei	2	10%

In vitro susceptibility data for Micafungin

- MIC₉₀ for C.parapsilosis : 2.0 μ g/mL
- C.glabrata : \leq 0.03 μ g/mL
- C.tropicalis : \leq 0.03 μ g/mL
- C.krusei : \leq 0.03 μ g/mL
- There were no isolates with MIC of $>$ 2 μ g/mL for micafungin .

Candidemia associated with preexisting fungal infections

	Cases (n)	Proportion (n/20*)%
Candidemia + Candiduria	8	40%
Candidemia + CVC Candida infection	7	35%
Candidemia + Other site Candida infection	4	20%
Only candidemia	1	5%

Adverse events

- Experienced treatment-related side effects:
 - Alkaline phosphatase increased: 4 (mild)
 - GOT and GPT elevation : 4 (mild)
 - Total bilirubin ↑ : 1 (shock at admission)
 - nausea or G-I upset : 3
 - hypokalemia: 2
 - skin rash : 0

Treatment failure

- Three patients with MRSA bacteremia co-infected with fungemia (each other with *C.glabrata*, *C.krusei* , *C.parapsilosis*) died of septic shock and multiple organ failure.
- Co-infected with bacteremia or other organs bacterial infection , may influenced the successful rate of anti-fungal therapy.
- Three patients had CVC or Port-A in place , may adversely influenced success rate.

Treatment outcome

- Successful cases : 17 patients
- Death : 3 patients
- Mortality rate : 3/20 = 15%
- Successful rate : 17/20 = 85%
- Conclusion:

The result of this study indicate that micafungin 100 mg daily is a safe and effective in the treatment of non-albicans candidemia .

Limitation of this study for clinical efficacy of micafungin in non-albicans candidemia

- First , there were relatively few patients in each individual non-albicans candida species
- Second, there were few patients with neutropenia , thus making it difficult to draw meaningful conclusions about the efficacy of the micafungin in such patients

Limitation of this study for clinical efficacy of micafungin in non-albicans candidemia

- Finally, 15% of patients (mortality) did not have vascular catheters removed, and this could have adversely influenced success rates.

Table 2. Prevalence of *Candida* species at baseline

Characteristic	Micafungin arms		Caspofungin arm (n=188)	p
	100 mg arm (n=191)	150 mg arm (n=199)		
Candidemia	163 (85.3)	168 (84.4)	161 (85.6)	.96
Noncandidemic ^a	28 (14.7)	30 (15.1)	26 (13.8)	.94
<i>Candida</i> species recovered ^b				
<i>C. albicans</i>	92 (48.2)	102 (51.3)	83 (44.1)	.4
Non- <i>C. albicans</i>	104 (54.5)	102 (51.3)	114 (60.6)	.2
<i>C. tropicalis</i>	31 (16.2)	33 (16.6)	32 (17.0)	.99
<i>C. glabrata</i>	28 (14.7)	34 (17.1)	33 (17.6)	.7
<i>C. parapsilosis</i>	29 (15.2)	21 (10.6)	42 (22.3)	.007
<i>C. krusei</i>	8 (4.2)	8 (4.0)	4 (2.1)	.5
Other ^c	14 (7.3)	10 (5.0)	11 (5.6)	.5

NOTE. Baseline was defined as the time blood study therapy was initiated.

^aCharacterized by the absence of any organisms of candidemia in all the data review panel's measurement at day 0.

^bIncludes *Candida* species recovered from culture of the organism during the study.

^cOne or more patients had *Candida* species recovered.

^dIncludes *C. guilliermondii*, *C. lusitana*, *C. rugosa*, *C. zeylanoides*, *C. kefyr*, *C. duboisii*, *C. lusitana*, *C. guilliermondii*, and unspecified *Candida* species.

CID 2007;45:603-613

Table 3. Treatment success for the modified intent-to-treat population

Variable	Mikafungin arms		Caspofungin arm (n=188)
	100 mg arm (n=191)	150 mg arm (n=199)	
Time to death ^a , median days (range)	14 (1.0-61.0)	14 (1.0-56.0)	14 (1.0-43.0)
Treatment success ^b			
Investigator	146 (76.4)	142 (71.4)	136 (72.3)
Data review panel	139 (72.8)	139 (69.8)	133 (70.7)
Clinical success ^c			
Overall	167 (87.4)	174 (87.4)	164 (87.2)
Candidemic ^d			
Complete response	128/163 (78.5)	136/168 (81.0)	123/161 (76.4)
Partial response	15/163 (9.2)	12/168 (7.1)	21/161 (13.0)
Noncandidemic			
Complete response	14/28 (50.0)	17/30 (56.7)	15/26 (57.7)
Partial response	10/28 (35.7)	9/30 (30.0)	5/26 (19.2)
Mycological success ^e	169 (88.5)	166 (83.4)	158 (84.0)

^a Number of days from first dose day of blinded study drug to first day of either blinded study drug or protocol-defined anti-fungal therapy, whichever was later.
^b Consensus by the investigator, the investigator and the data review panel assessment was 92.7%.
^c Includes patients without candidemic but with candida species recovered from culture of a normally sterile site.
^d Includes patients without candidemic but with candida species recovered from culture of a normally sterile site.
^e Includes patients without candidemic but with candida species recovered from culture of a normally sterile site.

CID 2007;45:883-893

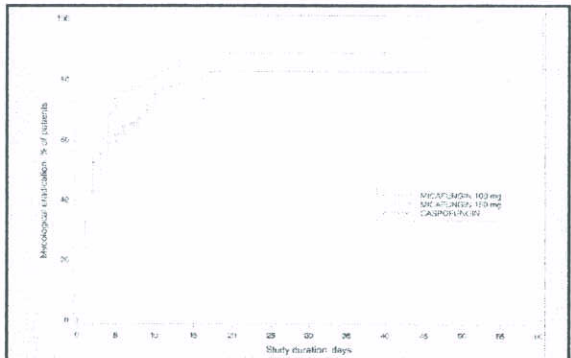


Figure 1. Kaplan-Meier estimate of time to death by treatment arm, based on blood culture results in the micafungin 100 mg, micafungin 150 mg, and caspofungin treatment arms. $P = 1.892$ for micafungin 100 mg vs. caspofungin and $P = 1.097$ for micafungin 100 mg vs. micafungin 150 mg by the log-rank test.

CID 2007;45:883-893

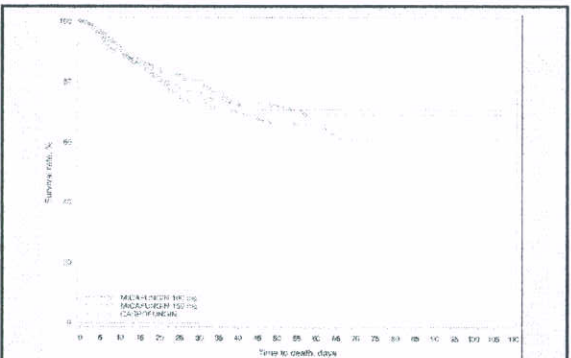


Figure 2. Kaplan-Meier estimate of time to death by treatment arm, based on blood culture results in the micafungin 100 mg, micafungin 150 mg, and caspofungin treatment arms. $P = 0.663$ for micafungin 100 mg vs. caspofungin, and $P = 0.4$ for micafungin 150 mg vs. caspofungin by the log-rank test.

CID 2007;45:883-893

Risk Factors for Bloodstream Infections Due to Fluconazole-Resistant *Candida glabrata*: A Case-Case-Control Study

Table: Risk Factors for Cg-BSI		
Variable	Fluconazole-resistant Cg-BSI Adjusted OR (95% CI); p value	Fluconazole-Susceptible Cg-BSI Adjusted OR (95% CI); p value
Fluconazole	2.3 (1.3-4.2); p=0.007	1.2 (0.6-2.4); p=0.53
Duration of Hospitalization	1.0 (1.0-1.0); p=0.16	
Cefepime	1.6 (0.9-2.9); p=0.089	2.2 (1.2-3.9); p=0.007
Linezolid	4.6 (2.2-9.3); p<0.001	
Metronidazole	1.5 (0.8-2.6); p=0.18	2.0 (1.1-3.5); p=0.015
Vancocycin	1.3 (0.7-2.4); p=0.35	1.3 (0.7-2.3); p=0.34

J. LEE, Washington, DC, ICAAC, 2008

Epidemiology, Treatment and Outcomes of Candidemia in Mechanically Ventilated Patients

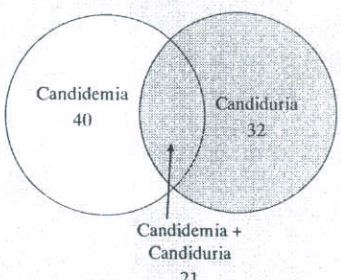
Species	Number	12 Week Mortality %
<i>C. albicans</i>	383	51
<i>C. glabrata</i>	176	61
<i>C. parapsilosis</i>	88	43
<i>C. tropicalis</i>	43	58

12 Week Mortality Based on Initial Therapy

Species/12 week mortality	Azoles	Echinocandins	P value
<i>C. albicans</i>	58/142 (41%)	47/118 (40%)	0.899
<i>C. glabrata</i>	16/30 (53%)	45/71 (63%)	0.379
<i>C. parapsilosis</i>	11/37 (30%)	10/16 (63%)	0.035
<i>C. tropicalis</i>	7/13 (54%)	10/14 (71%)	0.440

M. A. FERRADA, Washington, DC, ICAAC, 2008

Candiduria and Invasive Candidiasis: A prospective Study with Molecular Characterization of *Candida albicans*



P. HUANG, Washington, DC, ICAAC, 2008

Candiduria and Invasive Candidiasis: A prospective Study with Molecular Characterization of *Candida albicans*

- 21 paired blood and urine *C. albicans* strains were available for molecular typing with IRS-PCR.
- The concordance rate: type I : 100%
type II: 86%
type III: 63%
- The strain concordance rate beyond coincidence rate suggest that either urine *C. albicans* ascended to cause candidemia or *C. albicans* in the blood seeded to urine as candiduria, instead of an innocuous event independent of candidemia.

IRS-PCR: infrequent-restriction-site - PCR

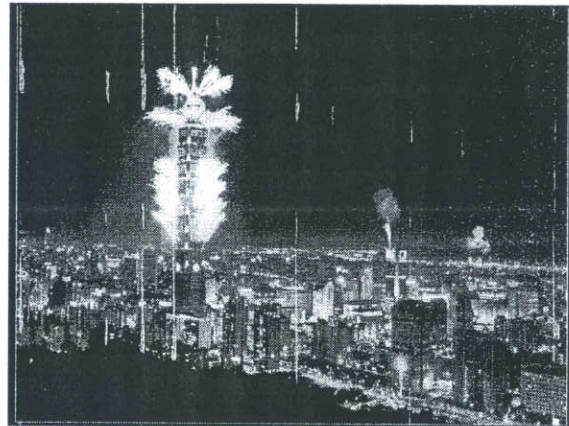
P. HEANG, Washington DC, ICAAC, 2008

Discussion and conclusion

- 1. The majority of our patients had candiduria, which can not be just ignored, especially for the critically ill patient.
- 2. In our study and another paper of CID (2007;45:883-93), an important observation that micafungin dosage of 100 mg and 150 mg daily are safe and effective.
- 3. Removal of catheter in place could have increased successful rate.

Discussion and conclusion

- 4. Candidemia caused by non-*albicans* species occurred more frequently in those with prolonged antibiotic exposure, medical devices in place, TPN, candiduria and chemotherapy.
- 5. Delayed appropriate anti-fungal therapy and host factors were associated with attributable mortality.



Thanks for your attention