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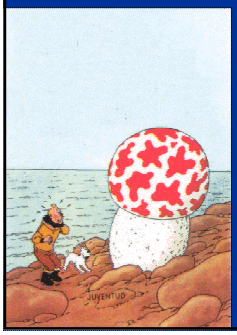
Colonización, Factores de Riesgo y Profilaxis de la Infección Fúngica en pacientes no inmunodeprimidos/ no trasplantados



IV Curso Antibioterapia Hospitalaria

Hospital Son Dureta

Dr. R Jordà Marcos

Medicina Intensiva

Clinica Rotger

Todo en 30 mn!

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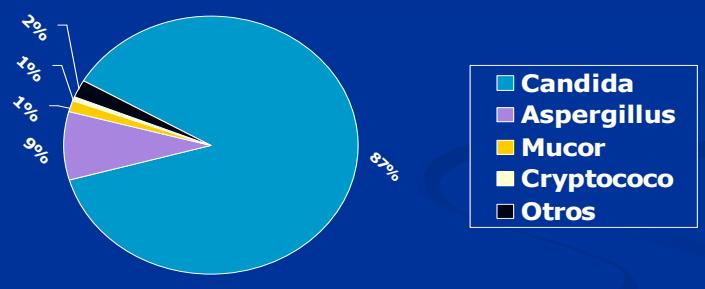
Infección fúngica en UCI



2

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Distribucion Candidemia

- 354 candidemias
- 4,3 casos/100.000 pacientes
- 0,53 casos /1.000 alta
- Distribucion:
  - Comunitaria 37 (11%)
  - **UCI** **115** **(33%)**
  - Otros H 193 (54%)

Almirante B. J Clin Microbiol; 2005: 43, 1829-1835

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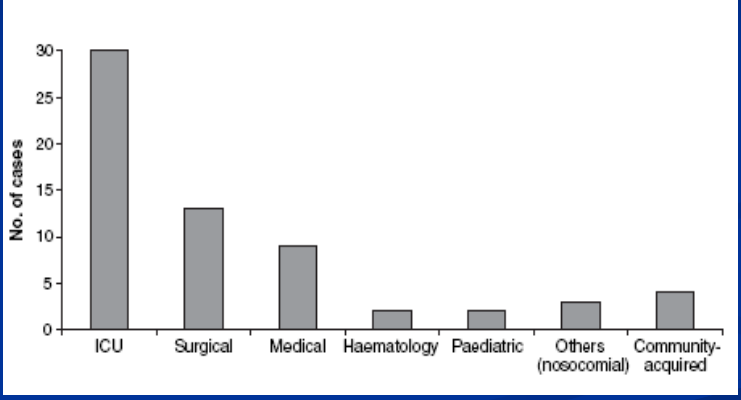
Epidemiología IF
Distribución hospitalaria



Boo TW. Mycoses; 2005: 48, 251–259

4

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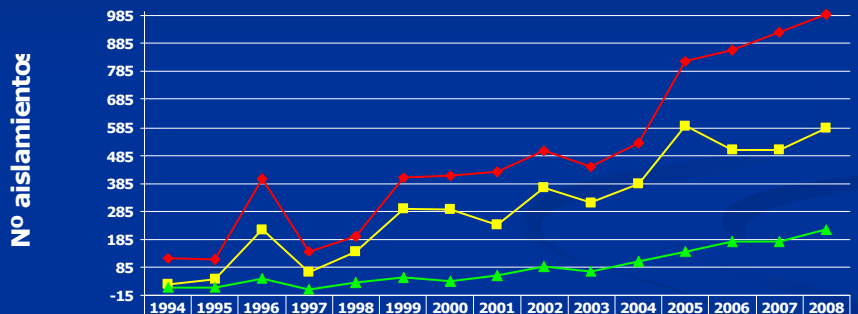
Infección Nosocomial en UCI. ENVIN. 1994-2008



	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BGN	116	113	402	141	195	404	413	426	500	443	529	822	862	926	991
CGP	25	43	219	67	141	294	292	238	370	317	385	592	506	506	585
Candida	13	12	46	6	33	50	34	58	89	69	106	142	176	179	221
%	8	7	7	2	8	6,3	4,6	8	9,2	8,3	10,6	9,1	11,5	11,8	12,7

5

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Infeccion fungica en UCI

Table 2. Commonly reported pathogens from patients in adult medical intensive care units (National Nasocomial Infections Surveillance 1992–1997)

Pathogen	Bloodstream Infection (%) (n = 2971)	Pneumonia Infection (%) (n = 4389)	Urinary Tract Infection (%) (n = 4956)	Cardio-vascular Infection (%) (n = 663)	Eye, Ear, Nose and Throat (n = 338)
Coagulase-negative staphylococci	36	1	2	43	14
Enterococci	16	2	14	10	5
Staphylococcus aureus	13	20	2	14	17
Candida albicans	6	5	21	6	9
Klebsiella pneumoniae	4	8	6	2	4
Pseudomonas aeruginosa	3	21	10	5	13
Enterobacter	3	9	5	5	7
Other candida	3	1	5	0.6	1
Escherichia coli	3	4	14	1	3
Candida glabrata	2	0.2	5	0.6	0.6
Acinetobacter	2	6	1	2	2
Serratia marcescens	1	4	0.7	1	2
Other fungi	0.8	1	8	1	2
Citrobacter	0.5	2	1	1	2
Proteus	0.5	2	2	1	2
Aspergillus	0	0.6	0	0	0

Richards M.J. et al Crit Care Med 1999; 27:887-892

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Comparativa de mortalidad

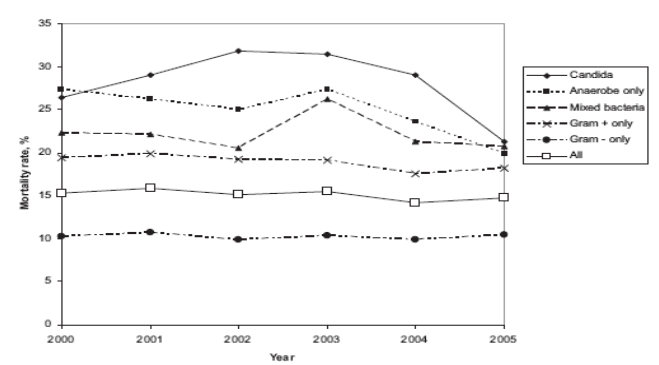

Figure 1. Trends in crude mortality by type of bloodstream infection.

Shorr AF; Crit Care Med 2009 Vol. 37, 2519

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Incidencia IF ENVIN 2008

HONGOS	TOTAL		≤7 días		> 7 días	
	n	%	n	%	n	%
Candida albicans	119	53,85	36	57,14	83	52,53
Candida glabrata	26	11,76	8	12,70	18	11,39
Candida tropicalis	21	9,50	5	7,94	16	10,13
Candida spp	19	8,60	8	12,70	11	6,96
Candida parapsilopsis	17	7,69	1	1,59	16	10,13
Otros	19	8,60	5	7,94	14	8,86
TOTAL	**221**		**63**		**158**	

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Candidemia. Aislamientos EPCAN

	Nº (%)	Persistente
• *Candida albicans*	36 (57,1)	6 (16%)
• *Candida parapsilosis*	11 (17,4)	1 (9%)
• *Candida spp.*	10 (15,8)	1 (10%)
• *Candida tropicalis*	3 (4,7)	2 (66,6%)
• *Candida glabrata*	3 (4,7)	0
Total	63 (100)	10 (15,9%)

Jordà. R, et al. Intensive Care Med 2000, 26:236.

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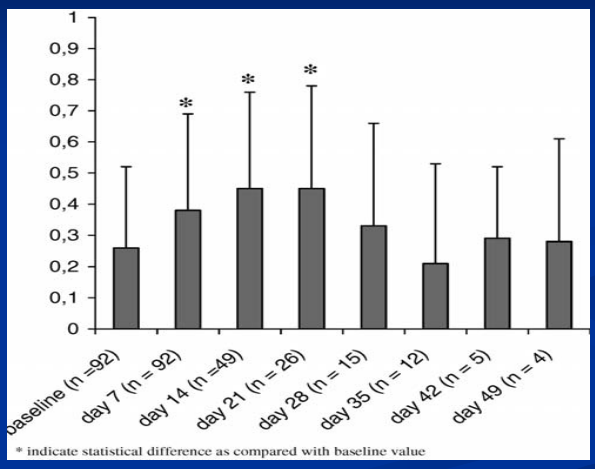
COLONIZACION

Epidemiología

Proyecto EPIFUCI		Proyecto EPCAN	
Tipo Estudio: Prevalencia		Incidencia	
N. Pacientes: 1468.		1766; estancia > 7 días	
Patología Primaria:			
Medica	897 (61.8%)		989 (56%)
Cirugía	343 (23.7%)		615 (34.8%)
Trauma	210 (14.5%)		340 (19,2%)
Colonización fúngica:	113 (7.6%)		900 (51.1%)
Infección fúngica:	125 (8,5%)		145 (8%)

Alvarez-Lerma,F et al. Intensive Care Med 2000; S3:S234
Sanchez, MA et al. Intensive Care Med 2000;S3:S234

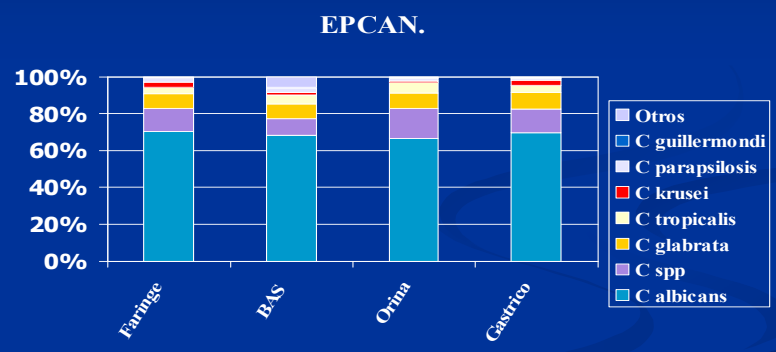
Colonización en UCI



Charles P.E.; Intensive Care Med (2005) 31:393–400

Clínica Rotger

Aislamiento fúngico en muestras screening



13

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Colonizacion

Table 3. Risk for death according to colonization and infection status (n = 1107)

Patient Group	Nonsurvivors No.	Mortality Rate (%)[a]	Relative Risk (95% CI)
No colonized or unifocal, n = 418	108	25.8	1
Multifocal, n = 631	201	31.9	1.23 (1.01–1.50)
Candida species infection, n = 58	30	51.7	2.00 (1.49–2.69)

CI, confidence interval.
[a] $p < 0.001$, linear association test.

Leon, C; Crit Care Med 2009; 37:1624 –1633

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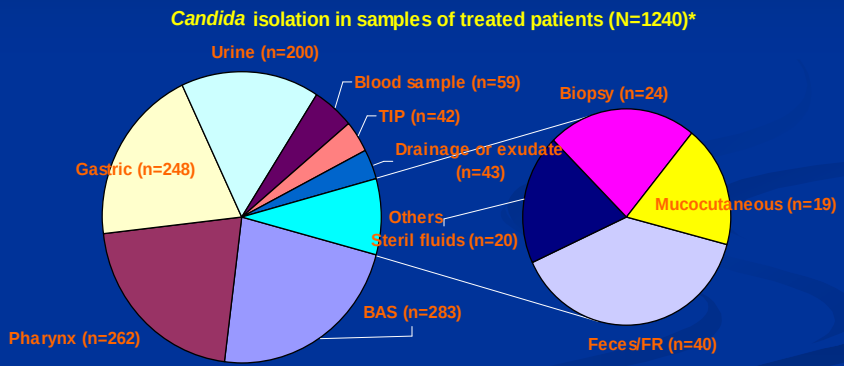
EPCAN Project
Isolations in 437 treated patients



15

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Colonización en pulmón

MICROORGANISMO	TOTAL		≤ 7 días		> 7 días		≤ 4 días		> 4 días	
	n	%	n	%	n	%	n	%	n	%
Pseudomonas aeruginosa	172	18,63	45	11,06	127	24,61	22	10,33	150	21,13
Staphylococcus aureus	104	11,27	85	20,88	19	3,68	50	23,47	54	7,61
Acinetobacter baumannii	83	8,99	17	4,18	66	12,79	5	2,35	78	10,99
Escherichia coli	70	7,58	23	5,65	47	9,11	13	6,10	57	8,03
Haemophilus influenzae	58	6,28	48	11,79	10	1,94	33	15,49	25	3,52
Candida albicans	53	5,74	22	5,41	31	6,01	9	4,23	44	6,20
Stenotrophomonas (Xanthomonas) maltophilia	46	4,98	7	1,72	39	7,56	1	0,47	45	6,34
Klebsiella pneumoniae	41	4,44	27	6,63	14	2,71	11	5,16	30	4,23
Enterobacter cloacae	34	3,68	19	4,67	15	2,91	10	4,69	24	3,38
Staphylococcus aureus meticilín resistente	33	3,58	10	2,46	23	4,46	4	1,88	29	4,08
Streptococcus pneumoniae	27	2,93	23	5,65	4	0,78	19	8,92	8	1,13
Serratia marcescens	26	2,82	12	2,95	14	2,71	4	1,88	22	3,10
Proteus mirabilis	23	2,49	11	2,70	12	2,33	3	1,41	20	2,82

ENVIN 2008

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Candida y pulmón ENVIN 2008

GRUPO	n	%
BGN	620	67,17
Gram +	208	22,54
Hongos	91	9,86
Otros	4	0,43
TOTAL	**923**	

MICROORGANISMO	TOTAL n	%
Candida albicans	53	58,24
Candida glabrata	10	10,99
Candida tropicalis	6	6,59
Aspergillus fumigatus	5	5,49
Candida lusitaniae	5	5,49
Otros	12	13,19
TOTAL	**91**	

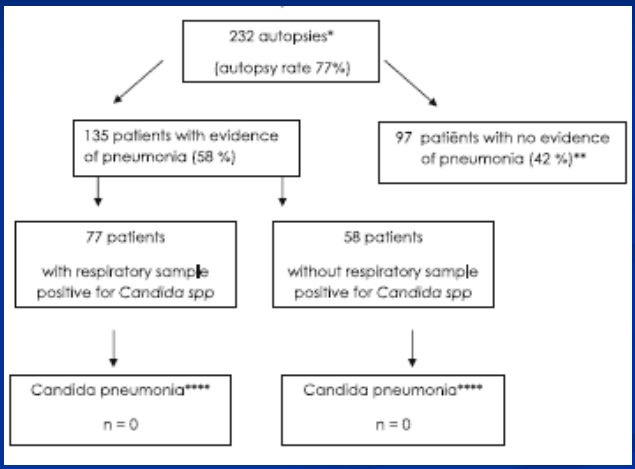
Fluconazol 5º antimicrobiano (6,28%) en tratamiento especifico

Caso clinico

- Mujer 47 a
- TCE. GS bdural D.
  frontotemporales
  ntragolpe
- 3º d NN p → Amoxi/clav.
- 10º d. S. f nfiltrados basales
  Micro puro Candida spp,

18

Aislamientos en pulmón



W. Meersseman. Intensive Care Med (2009) 35:1526–1531

19

FR y colonización

Table 4 Multivariate analysis of predictive factors of growing colonization index in the ICU (β regression coefficient, *Conf. int.* confidence interval)

	β	95% Conf. int.	p
Broad-spectrum antibiotic therapy (no. of days)	0.01	0.01 to 0.02	≤0.05
Systemic antifungal therapy (no. of days)	−0.02	−0.03 to 0.01	≤0.05
Hematological malignancy	0.41	0.09 to 0.73	≤0.05
Candiduria	0.20	0.09 to 0.31	≤0.05

Charles P.E.; Intensive Care Med (2005) 31:393–400

Clínica Rotger

Factores Riesgo. Análisis multivariante

			Odds ratio	CI
	NCI	C		
Antibioticoterapia	93.5%	98.4%	3	1.5 - 5.2
Cirugía programada	12.8%	10.8%	1,4	1-2l
	NCI	INF		
NPT	38%	78%	2.7	1.4 - 5
Cirugía urgente	22.3%	39.3%	2	1.3-3.2
	COL	INF		
Tto. esteroideo	24.3%	34.5%	1.8	1.1 - 2.7
Cirugía urgente	27.1%	34.5%	1.8	1.1-2.7
Cirugía programada	10.8	16.6	1.8	1.1 - 3

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Factores de riesgo de candidemia

22

22

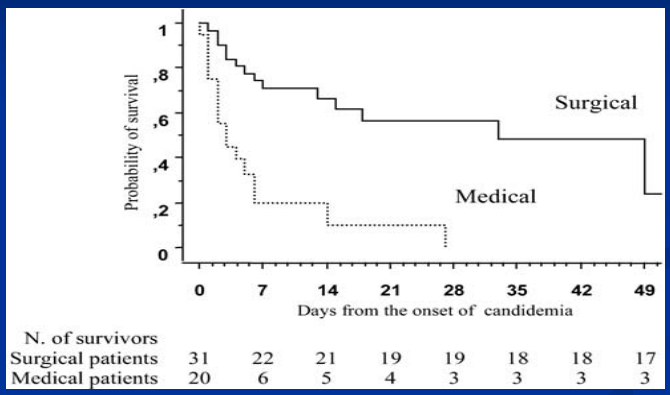
Factores de riesgo de candidemia

Table 1 Commonly recognized risk factors for invasive *Candida* infection

Risk factors
Neutropenia
Cancer chemotherapy
Colonization with *Candida* spp.
Broad-spectrum antibiotic use
Presence of a central venous catheter
Hemodialysis or renal failure
Severity of illness (Apache score)
Parenteral nutrition
Mechanical ventilation
Prior surgery
Age

Benoit P.G.;Intensive Care Med (2009) 35:55–62

Candidemia según paciente



Charles P.E. Intensive Care Med (2003) 29:2162–2169

FR de candidemia
Pacientes inmunocompetentes

TABLE 2
MATCHED (IE, PRINCIPAL DIAGNOSIS, AGE, AND LENGTH OF STAY) CASE–CONTROL MULTIVARIATE ANALYSIS FOR PREDICTORS OF CANDIDEMIA

Variable	Unit	Adjusted OR	CI_{95}
Hickman catheter	Yes/no	9.53	1.34–68.01
Gastric acid suppressants	Yes/no	6.38	2.33–17.43
ICU admission	Yes/no	6.40	2.12–19.31
Nasogastric tube	Yes/no	3.69	1.27–10.78
No. of antibiotics	Continuous	1.46	1.15–1.86

OR = odds ratio; CI_{95} = 95% confidence interval; ICU = intensive care unit.

Puzniak, L. *Infect Control Hosp Epidemiol* 2004;25:628-633

FR candidemia en UCI

Estudio caso control
Ingreso > 3 d
88 pares de pacientes
FR recogidos en estudio previo

Table 2. Results from conditional logistic regression analysis of 88 case-control matched patients.

Independent variable	Parameter estimate	SE	*P*
No. of antibiotics	0.5454	0.1737	.0017
Candida site	2.3390	0.7618	.0021
Hickman catheter	1.9787	0.9445	.0362
Hemodialysis	2.8973	1.2779	.0234

Wenzel R.P; Clinical Infectious Diseases 2005; 41:S389–93

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Factores de riesgo

Variable	No col/in 720 (40.7)	Coloniz. 880(49.8)	Infección 105 (5.9)	p
Edad (a.)	56.4 ± 17.4	58.8 ± 17.0	58.3 ± 16.8	.017
APACHE II_i	18.9 ± 8.1	19.1 ± 7.8	19.4 ± 6.8	NS
Evolución UCI	178 (24.7)	271 (30.8)	56 (53.3)	< 0.0005
Evolución planta	60 (11.3)	84 (14.1)	8 (7.6)	NS
Cirugía urgente	162 (22.5)	237 (26.9)	48 (45.7)	<0.0005
Cirugía programada	92 (12.8)	94 (10.7)	24 (22.9)	= 0.001 [a,]

27

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Factores de riesgo

Variable	No col/in 720 (40.7)	Coloniz. 880(49.8)	Infección 105 (5.9)	p
VM	640 (88.8)	854 (94.9)	139 (95.9)	<0.0005
CA	498 (69.1)	676 (75.1)	107 (73.8)	= 0.021
CVC	711 (98.6)	890 (98.9)	145 (100)	NS
SU	703 (97.5)	887 (98.6)	141 (97.2)	NS
NPT	274 (38.0)	470 (52.2)	113 (77.9)	<0.0005

28

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Factores Riesgo Candidemia. EPCAN

Table 3 Risk factors for candidaemia. Results of multivariate analysis

Variable	Odds ratio	95% Confidence interval	*P*-value
Haemofiltration procedures	1.96	1.06–3.62	0.032
Elective surgery	2.75	1.17–6.45	0.020
Total parenteral nutrition	3.89	1.73–8.78	0.001
Candida spp. colonisation	4.12	1.82–9.33	0.001

	Candidemia			
Variable	**Presente 63**	**Ausente 1702**	**p<**	**OR (95% IC)**
Días UCI	28	18	0.0005	
Mortalidad UCI	34 (54%)	501 (29,4%)	0.0005	2.81 (1.69–4.66)

Jorda Marcos R. ; Mycoses. 2007 Jul;50(4):302-10.

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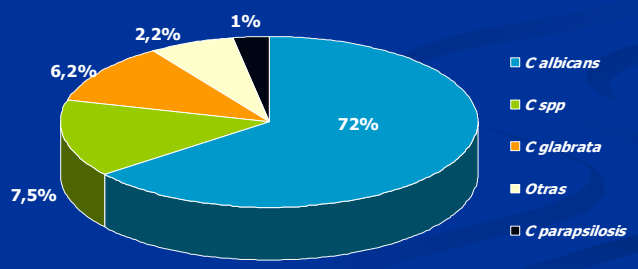
Candidemia
Especies aisladas en colonización (N=211)

- Colonizado 56 (88,9%)
  - Unifocal: 28 (44,4%)
  - Multifocal: 28 (44,4%)
- Sin colonización 7 (11,1%)



30

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Cambio de colonización a infección

COLONIZACION		INFECCION
17	APACHE II	28
< 0.5	Indice de colonizacion *Candida*	> 0.5
< 0.4	Indice corregido de colonización *Candida*	> 0.4

- I.C. : Relación entre muestras no sanguineas positivas y testadas
- I.C.C : I.C. x relacion entre numero de muestras con crecimiento elevado de *Candida* (> 10^5 cfu/ml) y el numero de muestras con crecimiento positivo.
- Pittet D. Ann Surg 1994;220:751-758.

31

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Cambio de colonización a infección

	SENS.	SPEC.	PPV	NPV
CI	100	69	66	100
CCI	100	100	100	100

Pittet D. Ann Surg 1994;220:751-758.

32

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Evaluación sistemas predicción

Table 2 Performance characteristics of risk predictive models applied to study cohort

	Clinical prediction rule 1[a]	Clinical prediction rule 2[b]	Colonisation index ≥0.5[c]	Corrected colonisation index ≥0.4[d]
Proportion of cohort meeting model (%)	21	49	42	11
Sensitivity (%)	47	80	87	60
Specificity (%)	79	51	60	90
PPV (%)	5.3	4	5.1	13
NPV (%)	98	99	99	99
LR (positive test)	2.2	1.6	2.1	6.0
LR (negative test)	0.7	0.4	0.2	0.4
Area under ROC curve (95% CI)	0.63 (0.47–0.78)	0.66 (0.53–0.78)	0.74 (0.62–0.84)	0.75 (0.60–0.90)

Playford EG; Intensive Care Med (2009) 35:2141–2145

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Candida Score

Table 4. Calculation of the Candida score: Variables selected in the logistic regression model

Variable	Coefficient (β)	Standard Error	Wald χ^2	*p* Value
Multifocal *Candida* species colonization	1.112	.379	8.625	.003
Surgery on ICU admission	.997	.319	9.761	.002
Severe sepsis	2.038	.314	42.014	.000
Total parenteral nutrition	.908	.389	5.451	.020
Constant	−4.916	.485	102.732	.000

ICU, intensive care unit.

Candida score = .908 × (total parenteral nutrition) + .997 × (surgery) + 1.112 (multifocal *Candida* species colonization) + 2.038 (severe sepsis). Candida score (rounded) = 1 × (total parenteral nutrition) + 1 × (surgery) + 1 (multifocal *Candida* species colonization) + 2 × (severe sepsis). All variables coded as follows: absent, 0; present, 1.

C. Leon; Crit Care Med 2006. 34,

CS y candidemia

Table 4. Rates of invasive candidiasis according to the *Candida* score

Cutoff Value	Incidence Rate (%) (95% CI)	Relative Risk (95% CI)
<3	2.3 (1.1–3.5)	1
3	8.5 (4.2–12.7)	3.7 (1.8–7.7)
4	16.8 (9.7–23.9)	7.3 (3.7–14.5)
5	23.6 (12.4–34.9)	10.3 (5.0–21.0)

Leon C.; Crit Care Med 2009 Vol. 37, 1624 1633

CS vs IC

Table 5. *Candida* score vs. colonization index discriminatory power

	Candida Score ≥3 (95% CI)	Colonization Index ≥0.5 (95% CI)
Area under ROC curve	0.774 (0.715–0.832)	0.633 (0.557–0.709)
Sensitivity	77.6 (66.9–88.3)	72.4 (60.9–83.9)
Specificity	66.2 (63.0–69.4)	47.4 (44.0–50.8)
Predictive positive value	13.8 (10.0–17.5)	8.7 (6.2–11.3)
Predictive negative value	97.7 (96.4–98.9)	96.1 (94.2–98.0)
Relative risk for invasive candidiasis	5.98 (3.28–10.92)	2.24 (1.28–3.93)

Leon C.; Crit Care Med 2009 Vol. 37, 1624 1633

Profilaxis en candidiasis

"El tratamiento antifungico empírico **debe ser considerado** en el paciente critico con factores de riego para candidiasis invasiva y en el que no se conozca otra causa de fiebre; y debe basarse en una evaluacion clínica de factores de riesgo, marcadores serologicos para candidiasis invasiva, y/o datos de los cultivos de lugares no esteriles" (B-III).

Pappas P.G.; Clinical Infectious Diseases 2009; 48:503–35

SDD /Fluconazol

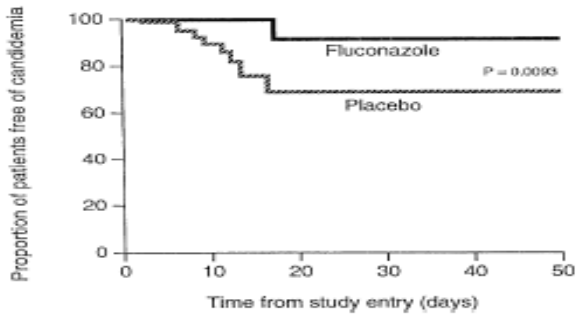

Fig. 3 Kaplan-Meier estimates of the percentages of fluconazole- and placebo-treated patients who remained free of candidemia. The difference in survival free of candidemia was statistically significant (p=0.0093, log-rank test)

Garbino J. Intensive Care Med (2002) 28:1708–1717

Clínica Rotger

SDD /Fluconazol

Table 3 Distribution of *Candida* spp in the two treatment arms (*n* total number of patients/number of patients in whom *Candida* species isolates were recovered)

	Colonization at study entry				Newly acquired *Candida* spp.				*Candida* infection			
	Fluconazole (*n*=51/49)		Placebo (*n*=56/53)		Fluconazole (*n*=24/24)		Placebo (*n*=31/30)		Fluconazole (*n*=6/6)		Placebo (*n*=16/16)	
C. albicans	41	80%	44	79%	15	62%	27	87%	5	83%	13	81%
C. tropicalis	–	–	2	3.6%	–	–	–	–	–	–	1	6.2%
C. krusei	2	3.9%	1	1.8%	1	4.2%	–	–	–	–	–	–
C. glabrata	2	3.9%	4	7.1%	2	8.3%	2	6.5%	1	17%	–	–
C. lusitaniae	–	–	1	1.8%	1	4.2%	–	–	–	–	1	6.2%
C. parapsilosis	1	2%	–	–	1	4.2%	–	–	–	–	1	6.2%
Saccharomyces cervisiae	1	2%	1	1.8%	1	4.2%	1	3.2%				
Unidentified *Candida* spp.	4	7.8%	3	5.4%	3	12%	1	3.2%	–	–	–	–

Garbino J. Intensive Care Med (2002) 28:1708–1717

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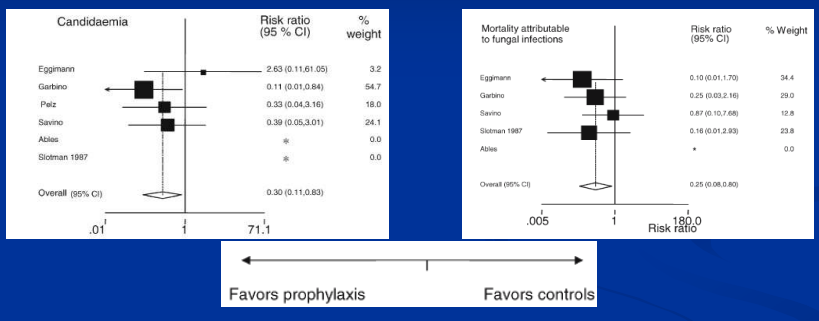
Profilaxis de la infecion por *Candida*



Cruciani M.; Intensive Care Med (2005) 31:1479–1487

40

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Profilaxis en pacientes quirurgicos

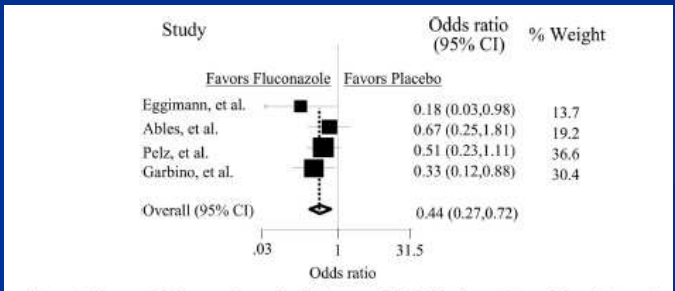

Figure 1. Impact of fluconazole prophylaxis on candidal infections. *CI*, confidence interval.

Andrew F.S.; **Crit Care Med 2005; 33:1928 –1935**

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Profilaxis y mortalidad

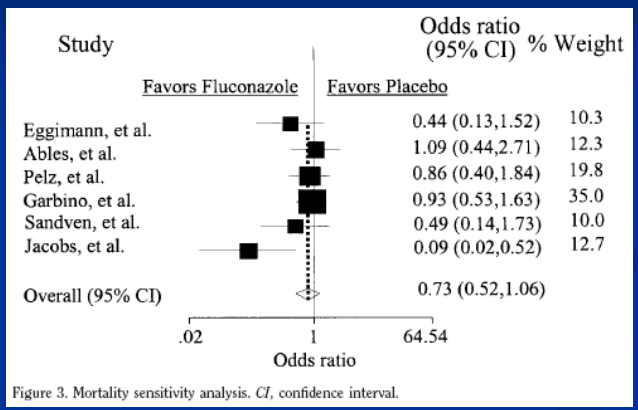

Figure 3. Mortality sensitivity analysis. *CI*, confidence interval.

Andrew F.S.; **Crit Care Med 2005; 33:1928 –1935**

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Dias de tratamiento

Table 2 Rates of patients free from fungal infections at a specified time. Data from three studies [21, 23, 24]

	Log-rank odds ratio (95% CI)	p	Probability[a]		% Risk reduction (95% CI)
			Treated	Controls	
5 days	2.31 (0.87 to 6.17)	0.09	95.2	97.9	−2.7 (−4.0 to 0.7)
10 days	0.43 (0.22 to 0.82)	0.01	95.2	88.7	11.5 (2.1 to 24.8)
15 days	0.21 (0.14 to 0.32)	≤0.0001	92.4	64.8	36.3 (27.2 to 44.0)
20 days	0.21 (0.14 to 0.30)	≤0.0001	89.2	55.2	34.4 (27.7 to 39.7)

[a] Product-limit probability from the time-specific pooled crude rates

Cruciani M.; Intensive Care Med (2005) 31:1479–1487

43

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Profilaxis con fluconazol

- 277 ptes con FR ingresados > 4d.
- 133 con fluconazol 800 mg
- APACHE II 20 vs 22

Table 4. Reasons for Failure at the End of the Primary Observation Period*

Outcome	Fluconazole Recipients (*n* = 122), *n* (%)	Placebo Recipients (*n* = 127), *n* (%)
Total failures	67 (55)	73 (57)
No resolution of fever	62 (51)	68 (54)
Documented invasive fungal infection	6 (5)†	11 (9)‡
Need for alternative antifungal agent	12 (10)	20 (16)

Mindy G. Schuster, Ann Intern Med. 2008;149:83-90.

Selección *Candida no-albicans.* Administración fluconazol.

Table 2. *Candida* Species Infection and Susceptibility Testing

Dates	*Candida* Species	No. (%) Resistant*	Resistant *Candida*
Jun 1994 to Dec 1997 (population 1)	27	3 (11)	*C albicans* (n = 2), *C krusei* (n = 1)
Jan 1998 to Dec 1998 (population 2)	11	4 (36)	*C glabrata* (n = 3), *C tropicalis* (n = 1)

*P = .16.

Rocco,T et al. Arch Surg 2000, 135:160-165

45

Conclusiones

- Existe un aumento en la incidencia de infeccion candidiasicas en pacientes no inmunodeprimidos/no trasplantados
- No se aprecia un aumento significativo en las especies de Candida no-albicans ni en las muestras de colonizacion ni en la infeccion.
- La colonizacion multiple se presenta en mas del 50% de los pacientes con ingreso superior a 7d.
- Es aconsejable la realizacion de cultivos de control de colonizacion en pacientes de riesgo
- Es aconsejable la identificacion de pacientes mediante escalas de riesgo de IF
- No está suficientemente valuado el uso indiscriminado de profilaxis antifungica. Existe un riesgo potencial de aparicon de especies *no-albicans.*
- Son necesarios un mayor numero de estudios, con criterios de inclusion estandarizados, que validen el tratamiento anticipado en estos pacientes


48

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FR de candidemia Colonización

Table 2. Incidences of invasive candidiasis/*Candida* species colonization during the study

	Week			
	2	3	4	5
Patients (n)	1107	652	378	252
New cases of invasive candidiasis	33	16	3	6
Incidence rate of invasive candidiasis (95% CI)	2.98 (1.97–3.98)	2.56 (1.32–3.80)	0.86 (0–1.82)	2.61 (0.55–4.67)
Accumulated cases of invasive candidiasis	33	49	52	58
New cases of *Candida* species colonization	734	75	18	7
Accumulated cases of *Candida* species colonization	734	809	827	834

Leon C; Crit Care Med 2009 Vol. 37, No. 5

Candidemia. Aislamientos EPCAN

	Nº (%)	Persistente
• Candida albicans	36 (57,1)	6 (16%)
• Candida parapsilosis	11 (17,4)	1 (9%)
• Candida spp.	10 (15,8)	1 (10%)
• Candida tropicalis	3 (4,7)	2 (66,6%)
• Candida glabrata	3 (4,7)	0
Total	63 (100)	10 (15,9%)

Jordà. R, et al. Intensive Care Med 2000, 26:236.

Colonización y candidemia

Isolate and site of colonization	No. (%) of patients: All	Case patients	Infection rate[a]	RR (95% CI)	P
Candida species					
In urine					
No	3649 (85)	25 (60)	0.79	—	
Yes	627 (15)	17 (40)	1.62	1.6 (0.9–3.1)	.13
In stool					
No	2996 (70)	16 (38)	0.70	—	
Yes	1280 (30)	26 (62)	1.34	1.4 (0.7–2.7)	.29
In both urine and stool					
No	3823 (89)	30 (71)	0.90	—	
Yes	453 (11)	12 (29)	1.35	1.1 (0.6–2.1)	.78
Candida albicans					
In stool					
No	2029 (71)	22 (58)	1.09	—	
Yes	820 (19)	16 (42)	1.25	1.0 (0.5–1.9)	.98
In urine					
No	3908 (91)	32 (76)	0.89	—	
Yes	368 (9)	10 (24)	1.59	1.4 (0.7–3.0)	.32

[a] Cases of candidal bloodstream infection per 1000 days in the surgical intensive care unit.

Lumberg,HM; Clinical Infectious Diseases 2001; 33:177–86

Procalcitonina y candidemia

Table 3. Diagnostic accuracy of a low serum PCT for discrimination between candidemia and bacteremia in critically ill patients with clinical sepsis and positive blood cultures.

PCT cutoff value (ng/ml)	No. of cases of candidemia below cutoff value	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
PCT ≤1.0	9	60.0	100	100	85.4
PCT ≤2.0	12	80.0	88.6	75.0	91.2
PCT ≤3.5	13	100	77.1	65.2	100

Charles P.E.; Intensive Care Med (2006) 32:1577–1583

Colonizacion y Mortalidad

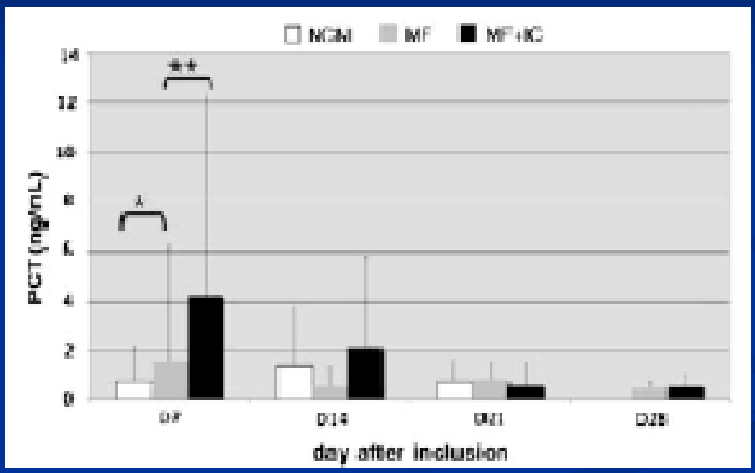
Table 3. Risk for death according to colonization and infection status (n = 1107)

Patient Group	Nonsurvivors: No.	Nonsurvivors: Mortality Rate (%)*	Relative Risk (95% CI)
No colonized or unifocal, n = 418	108	25.8	1
Multifocal, n = 631	201	31.9	1.23 (1.01–1.50)
Candida species infection, n = 58	30	51.7	2.00 (1.40–2.86)

CI, confidence interval.
*p < 0.001, linear association test.

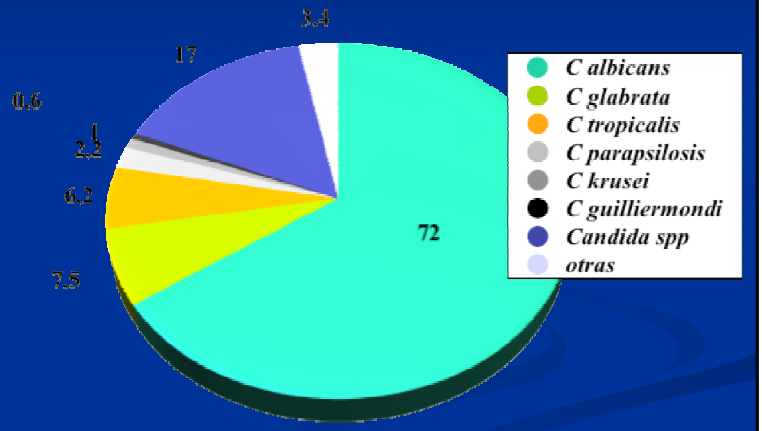
Leon C.; Crit Care Med 2009 Vol. 37, 1624 1633

Procalcitonina y colonizacion



Charles P.E.; Intensive Care Med (2009) 35:2146–2150

Especies aisladas en colonización (N=503)



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Candidemia. Factores riesgo.

Model, risk factor	RR[a] (95% CI)	*P*
Model 1[b]		
Antifungal medication	0.3 (0.1–0.6)	<.001
Acute renal failure	4.2 (2.1–8.3)	<.001
Parenteral nutrition	3.6 (1.8–7.5)	<.001
Any surgery	7.3 (1.0–53.8)	.05

Lumberg,HM; Clinical Infectious Diseases 2001; 33:177–86

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Candidiasis en UCI

- Colonización frecuente en paciente manipulado y estancia prolongada
- Diagnostico de candidiasis difícil en cultivos no hematicos
- Prevalencia de candidiasis es infravalorizada
- Riesgo de inicio tardío del tratamiento
- Aumento de tratamiento anticipado en pacientes de riesgo
- Tendencia al uso de profilaxis en pacientes de riesgo

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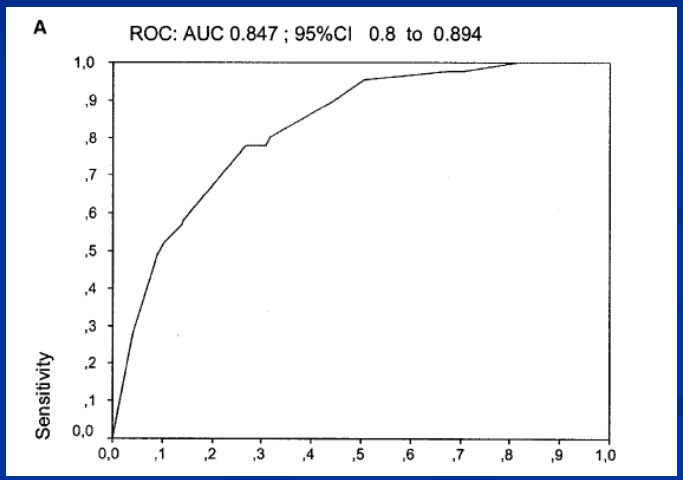
Sensibilidad del candida score



Evolucion Especies Candida

Table 1 Breakdown of Candida isolates according to species and year of isolation

	Year 1 Aug 00–July 01	Year 2 Aug 01–July 02	Year 3 Aug 02–July 03	Year 4 Aug 03–July 04
No. of episodes/year[a]	16	24	25	30
C. albicans	4 (25.0%)	9 (37.5%)	17 (68.0%)	14 (46.7%)
Non-albicans *Candida*	11 (68.8%)	14 (58.3%)	8 (32.0%)	13 (43.3%)
Candida sp. (not identified)	1 (6.3%)	1 (4.2%)	0 (0.0%)	3 (10.0%)
C. glabrata	5 (31.3%)	10 (41.7%)	1 (4.0%)	7 (23.3%)
C. parapsilosis	3 (18.8%)	2 (8.3%)	3 (12.0%)	2 (6.7%)
C. tropicalis	1 (6.3%)	0 (0.0%)	2 (8.0%)	2 (6.7%)
C. krusei	1 (6.3%)	2 (8.3%)	1 (4.0%)	0 (0.0%)
C. lusitaniae	1 (6.3%)	0 (0.0%)	0 (0.0%)	1 (3.3%)
C. guilliermondii	0 (0.0%)	0 (0.0%)	1 (4.0%)	1 (3.3%)
Total isolates	16	24	25	30

[a]Percentages not presented because some episodes had more than one isolate.

Aliyu SH; Q J Med 2006; 99:655–663

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FR mortalidad de candidemia

Table 5 Independent predictors for mortality using forward stepwise logistic regression model for multivariate analysis.

Risk factor	OR	95% CI	*P*-value
Age ≥65 years	7.2	1.5–33.6	0.013
Severe GI dysfunction	10.6	1.8–63.4	0.01
Acute renal failure	7.6	1.3–43.1	0.022
Recent/concurrent bacteraemia	5.2	1.1–25.1	0.042
Endotracheal intubation	7.7	1.5–39.5	0.014
Major surgery during current admission	0.05	0.007–0.34	0.002

GI, gastrointestine; OR, odds ratio; CI, confidence interval.

Boo T.W. Mycoses 2005; 48, 251–259