



İnvazif fungal infeksiyon olgularında klinik bulgular ve tedavi yaklaşımları Kandidiyazis

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24 Şubat 2018

Sunum Planı

- Giriş

Hangi transplantasyonda, ne zaman kandidiyazis

- Klinik

SOT, Karaciğer, Böbrek transplantasyonu

- Tedavi- Profilaksi

Hangi transplantasyonda, ne zaman
kandidiyazis

Approach to the Solid Organ Transplant Patient with Suspected Fungal Infection



Judith A. Anesi, MD^a, John W. Baddley, MD, MSPH^{b,c,*}

KEYWORDS

- Solid organ transplant • Invasive fungal infection • Candida • Aspergillus
- Endemic fungi • Cryptococcus • Mold

KEY POINTS

- Identification of invasive fungal infections (IFIs) can be challenging, because the signs and symptoms are similar to other infections and diagnostic techniques are limited.
- *Aspergillus* and *Candida* species are the most frequent causes of IFIs in solid organ transplant (SOT) recipients.
- When an SOT recipient presents with pulmonary symptoms, chest imaging should be performed to evaluate for a fungal cause, which typically presents with nodular opacities.
- Because of immunosuppression, typical morphology of fungal skin lesions may be altered in SOT recipients, making skin biopsy an essential step for diagnosis.

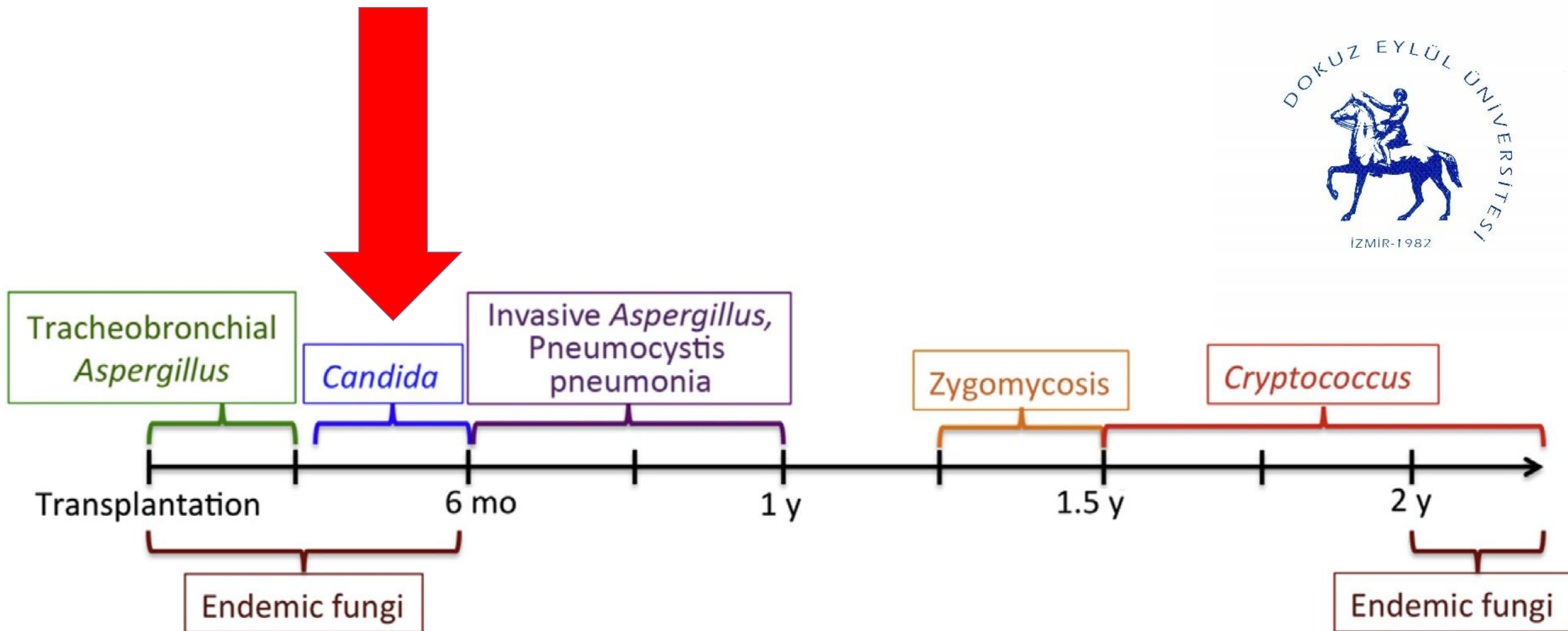


Table 1
Epidemiology of invasive fungal infection in solid organ transplant recipients

Organ Transplanted	IFIs in Order of Decreasing Frequency					
Kidney	<i>Candida</i>	>	<i>Crypto</i>	>	<i>Aspergillus</i>	> Endemic mycoses > Molds > PJP
Liver	<i>Candida</i>	>	<i>Aspergillus</i>	>	<i>Crypto</i>	> Endemic mycoses > Molds > PJP
Pancreas	<i>Candida</i>	>	Endemic mycoses	>	<i>Aspergillus</i>	≈ <i>Crypto</i> > Molds > PJP
Lung	<i>Aspergillus</i>	>	<i>Candida</i>	>	Molds	> <i>Crypto</i> > PJP > Endemic mycoses
Heart	<i>Candida</i>	>	<i>Aspergillus</i>	>	Molds	> <i>Crypto</i> > Endemic mycoses > PJP
Small bowel	<i>Candida</i>	>	<i>Crypto</i>	>	<i>Aspergillus</i>	> Endemic mycoses > Molds > PJP

SOT

KLİNİK

Karaciğer

Böbrek

TRANSNET , ESCMID-ESGICH, AST

The epidemiology and outcomes of invasive *Candida* infections among organ transplant recipients in the United States: results of the Transplant-Associated Infection Surveillance Network (TRANSNET)



David R. Andes¹

2001- 2006 - ABD
15 merkez prospektif
17 000 olgu

594 (% 3.4) SOT - 639 kandidiyazis
(533 kanıtlanmış, 106 olası)

factor identified was choice of antifungal drug class based upon infecting *Candida* species.

Conclusion: These data highlight the common and distinct features of IC in OTRs.

Transplant Infect Dis 2016; 18: 921-31

TRANSNET

Variable	All species N (%)	<i>C. albicans</i> <u>296 (46.3)</u>	<i>C. glabrata</i> 156 (24.4)	<i>C. krusei</i> 20 (3.1)	<i>C. parapsilosis</i> 52 (8.1)	<i>C. tropicalis</i> 25 (3.9)
Heart	48/635 (7.6)	25/294 (8.5)	9/155 (5.8)	2/20 (10.0)	5/52 (9.6)	1/25 (4.0)
Lung	55/635 (8.7)	30/294 (10.2)	9/155 (5.8)	0/20 (0.0)	6/52 (11.5)	6/25 (24.0)
Pancreas	38/635 (6.0)	18/294 (6.1)	13/155 (8.4)	1/20 (5.0)	3/52 (5.8)	0/25 (0.0)
Small bowel	9/635 (1.4)	2/294 (0.7)	4/155 (2.6)	1/20 (5.0)	1/52 (1.9)	1/25 (4.0)
Kidney	<u>224/635 (35.3)</u>	95/294 (32.3)	62/155 (40.0)	6/20 (30.0)	22/52 (42.3)	7/25 (28.0)
Liver	<u>261/635 (41.1)</u>	124/294 (42.2)	58/155 (37.4)	10/20 (50.0)	15/52 (28.8)	10/25 (40.0)
Kidney-pancreas	58/635 (9.1)	27/294 (9.2)	18/155 (11.6)	1/20 (5.0)	3/52 (5.8)	1/25 (4.0)

68 (% 10.6) tx için birden fazla tür etken

TRANSNET

Variable	All species N (%)	<i>C. albicans</i> 296 (46.3)	<i>C. glabrata</i> 156 (24.4)	<i>C. krusei</i> 20 (3.1)	<i>C. parapsilosis</i> 52 (8.1)	<i>C. tropicalis</i> 25 (3.9)
Infection site						
Bloodstream	<u>286/639 (44.8)</u>	95/296 (32.1)	91/156 (58.3)	9/20 (45.0)	40/52 (76.9)	19/25 (76.0)
Abdominal	<u>90/639 (14.1)</u>	46/296 (15.5)	19/156 (12.2)	2/20 (10.0)	2/52 (3.8)	0/25 (0.0)
Pulmonary	36/639 (5.6)	26/296 (8.8)	6/156 (3.8)	0/20 (0.0)	1/52 (1.9)	3/25 (12.0)
Disseminated	23/639 (3.6)	11/296 (3.7)	8/156 (5.1)	1/20 (5.0)	0/52 (0.0)	1/25 (4.0)
CNS	4/639 (0.6)	3/296 (1.0)	0/156 (0.0)	1/20 (5.0)	0/52 (0.0)	0/25 (0.0)

Transplantasyon sonrası 80. gün (14-545)

% 44 kan dolaşımı
% 14 intra-abdominal

The epidemiology and outcomes of invasive *Candida* infections among organ transplant recipients in the United States: results of the Transplant-Associated Infection Surveillance Network (TRANSNET)



David R. Andes¹ | Nasia Safdar¹ | John W. Baddley² | Barbara Alexander³ |

Kandidiyazis ilişkili 90. gün genel mortalite; **% 26.5** (168/635)

Akciğer Tx % 36.4

Karaciğer Tx % 30.9

Kalp Tx % 25.5

Albicans dışı mortalite yüksek

C parapsilosis % 35.2

C tropicalis % 44

→ Allograft rejeksiyonu en sık - % 52.1

Variable	Odds ratio	Lower	Upper	P-value
<i>Candida</i> species subgroup				
All species				
Liver transplant	1.63	0.96	2.76	.071
Renal insufficiency	2.31	1.46	3.66	<.001
Hepatic insufficiency	1.68	0.97	2.91	.066
CHF	3.54	1.61	7.81	.002
Pulmonary site	2.88	1.35	6.16	.006
Prednisone	0.39	0.25	0.63	<.001
Amphotericin B	1.99	1.24	3.2	.004
Early disease	0.51	0.3	0.84	.009

Invasive funga

J. Gavalda¹, Y. Meije¹, J. F
of the ESCMID Study Gr

Hot Topics

- Solid organ transpla
of invasive fungal d
spp. and *Aspergillus*
- *Candida* spp. is th
transplant recipient
- The absence of
differences in IFD i
that there are no
diagnosis and preve
- Universal prophylax
used in renal, liv

Transplant type	Target population
Liver	High-risk liver transplant recipients: Major: MELD score >30 Re-transplantation, fulminant hepatic failure, <u>Renal failure requiring replacement therapy,</u> Minor: MELD score 20–30, split, living-donor >40 transfusion blood products, <u>choledochojejunostomy</u> (Roux-en-Y) Renal failure not requiring replacement therapy (<u>CrCl <50 mL/min</u>) Early re-intervention, multifocal colonization/infection by <i>Candida</i> spp. Pancreas Post-perfusion pancreatitis, acute rejection and poor initial allograft function Vascular thrombosis, enteric drainage, anastomotic problems, <u>haemodialysis</u> <u>Laparotomy after transplantation</u> Intestinal <u>Acute rejection and poor initial allograft function,</u> <u>haemodialysis, laparotomy after transplantation,</u> <u>anastomotic problems, over-immunosuppression</u> Heart <u>Acute rejection, haemodialysis, re-exploration after</u> <u>transplantation</u>

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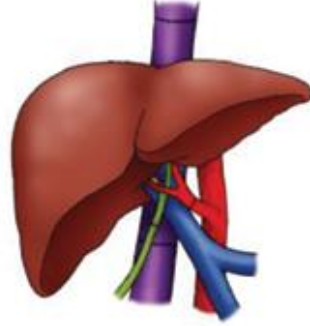
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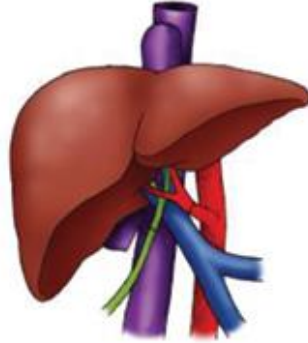


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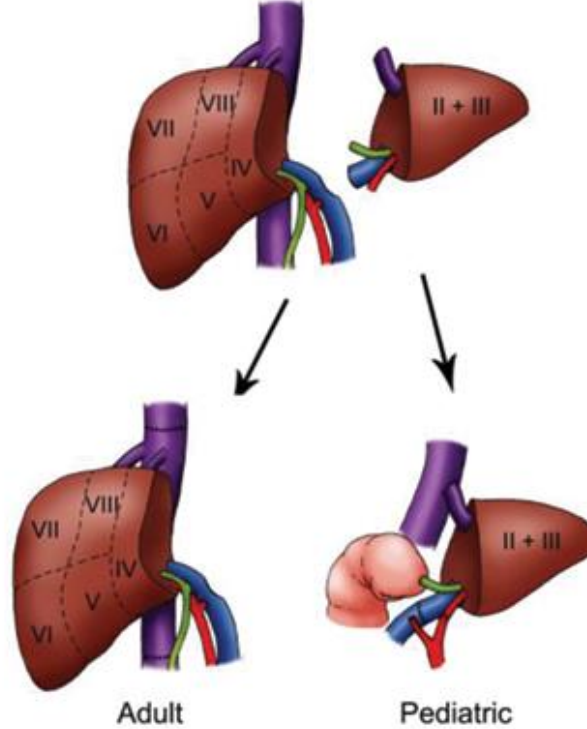
1) Conventional technique



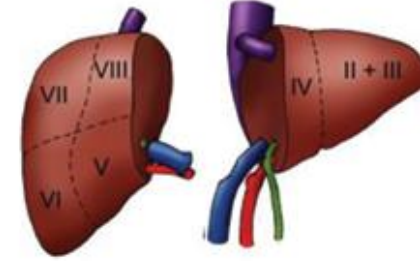
2) Piggyback technique



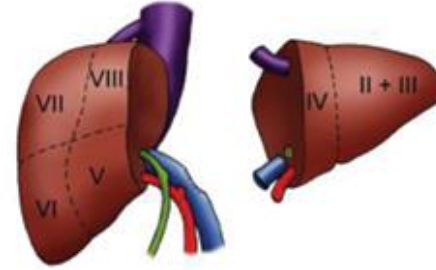
3) Split liver



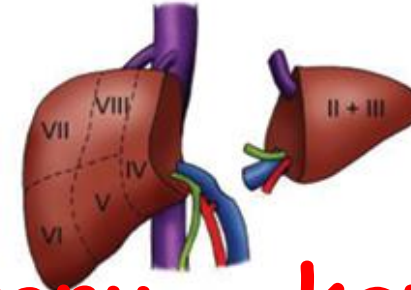
4) Living donor right lobe liver transplantation



5) Living donor left lobe liver transplantation



6) Living donor left lateral segment transplantation



Karaciğer transplantasyonu - kandidiyazis

OPEN

Invasive Recipient Infections for Mortality

Matteo Bassetti, M

Background.

(LTRs). In this pa
ies and case-ser
formed a retros
during the perio
age was 52.5 ye
Candidemia rep
mortality was 23
5.6%, $P = 0.02$).

ate analysis showed candidemia to be a risk factor associated with mortality among LTRs presenting ICIs (odds ratio, 11.8; confidence interval, 1.5-280; $P = 0.01$). *Candida albicans* represented the most common isolate (59.5%). High rates of antifungal resistances were found, with 16.7% and 4.8% of isolates displaying resistance to azoles and caspofungin, respectively. **Conclusions.** Our study confirms the occurrence of high mortality rates in LTRs developing ICIs. Mortality rates varied according to the type of infection, with candidemia representing a risk factor for mortality. The high rates of antifungal resistance should be considered in the choice of the empiric antifungal regimen.

2011 Ocak- 2013 Aralık
Avrupa-Brezilya 10 merkez
Retrospektif
42 kc tx (% 42.9 Viral hepatit)

24 (% 57.1) kandidemi
18 (% 42.9) intra-abd. kandidiazis

OPEN

Invasive Candida Infections in Liver Transplant Recipients: Clinical Features and Risk Factors for

Matte

Kandidemi ;

En az bir kan kültürü (+)

Intra-abdominal kandidiyazis; (Mikr/Kültür)

- Intra-abd. perop/asp örneği, biopside (+)
- Sekonder peritonitte kan kültürü (+)
- 24 saat içinde - drenajdan kültür (+)

candida growth from blood cultures in clinical setting of
secondary and tertiary peritonitis;
candida growth from drainage tubes only if placed less than
24 hours before the cultures¹⁰;

OPEN

Invasive Candida Infections in Liver Transplant Recipients: Clinical Features and Risk Factors for Mortality

Matteo Bassetti, MD, PhD,¹ Maddalena Peghin, MD,¹ Alessia Carnelutti,¹ et al.
Centers included with local incidence of ICIs

Insidans % 3.47

Name of center, city	Country	No. ICI episodes	Total number of liver transplants (2011-2013)	Incidence in the study period (2011-2013)
AOU Molinette, Torino	Italy	6	240	2.5%
AOU SMM, Udine	Italy	1	90	1.1%
AOU Pisana, Pisa	Italy	7	325	2.15%
San Martino IST, Genova	Italy	1	0 (not a transplant center)	
Policlinico Gemelli, Roma	Italy	1	86	1.16%
Val d'Hebron Hospital, Barcelona	Spain	3	82	3.7 %
Gregorio Maranon, Madrid	Spain	9	109	8.2%
University Hospital Leuven, Leuven	Belgium	10	211	4.7%
Sant James Hospital, Dublin	Ireland	1	0 (Not a transplant center)	
San Paolo University, San paolo	Brazil	3	65	4.6%

İnfeksiyon zamanı 151 (14-1037) gün

OPEN

Kandidemili (≤ 3 ay) olgularında;

% 68.4'ünde

% 50 Akut re

% 100 sağlık l

İntra-abd kandidiyazis olgularında;

Ateş % 66.7 (+)

% 38.9 Peritonit, intra-abd apse (+)

% 33.3 YBÜ yatışı

% 26.2 septik şok

% 16.7 safra yolu enfeksiyonu

9/24 (37.5%)

1/18 (5.6%)

0.02

^a Among cirrhotic patients (N = 19).

OPEN

Invasive Candida Infections in Liver Transplant Recipients: Clinical Features and Risk Factors for Mortality

Matteo Bassetti, MD, PhD,¹ Maddalena Peghin, MD,¹ Alessia Canelutti, MD,¹ Elda Righi, MD, PhD,¹

Candida albicans en sık etken

Characteristics	N = 42	Survivors (n = 32)	Nonsurvivors (n = 10)	P
Candida specie				
<i>C. albicans</i>	25 (59.5%)	19 (59.4%)	6 (60%)	NS
<i>C. tropicalis</i>	5 (11.9%)	2 (6.25%)	3 (30.0%)	0.05
<i>C. parapsilosis</i>	3 (7.1%)	2 (6.25%)	1 (10%)	NS
<i>C. glabrata</i>	2 (4.8%)	2 (6.25%)	0 (0%)	NS
<i>C. kruzei</i>	2 (4.8%)	2 (6.25%)	0 (0%)	NS
<i>C. dubliniensis</i>	1 (2.4%)	1 (3.1%)	0 (0%)	NS
More than 1 Candida	4 (9.5%)	4 (12.5%)	0 (0%)	NS
Concomitant bacterial infection	20 (47.6%)	14 (43.8%)	6 (60%)	NS
Duration of antifungal treatment: median (IQR), d	14 (10-30)	19.5 (10.5-34.8)	11 (7.8-22.5)	NS

mortalitesi yüksek

Mortalite Kandidemili olgularda daha yüksek

2003 Ocak - 2012 Aralık
388 Kc Tx
10 (% 2.6) kandidemi
29 (7 - 309) gün

R
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1
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4

5 Department of General Surgery, School of Medicine, Dokuz Eylül University, Izmir, Turkey

⁶ Department of Anesthesiology and Reanimation, School of Medicine, Dokuz Eylül University, Izmir, Turkey

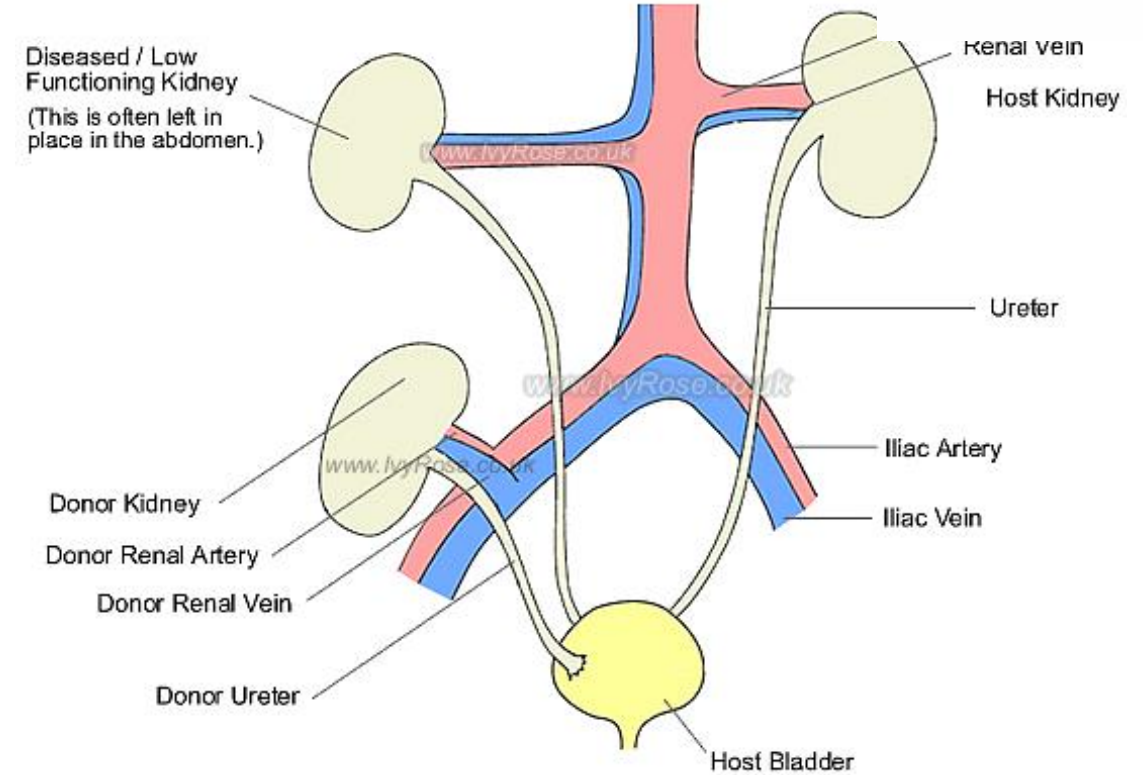
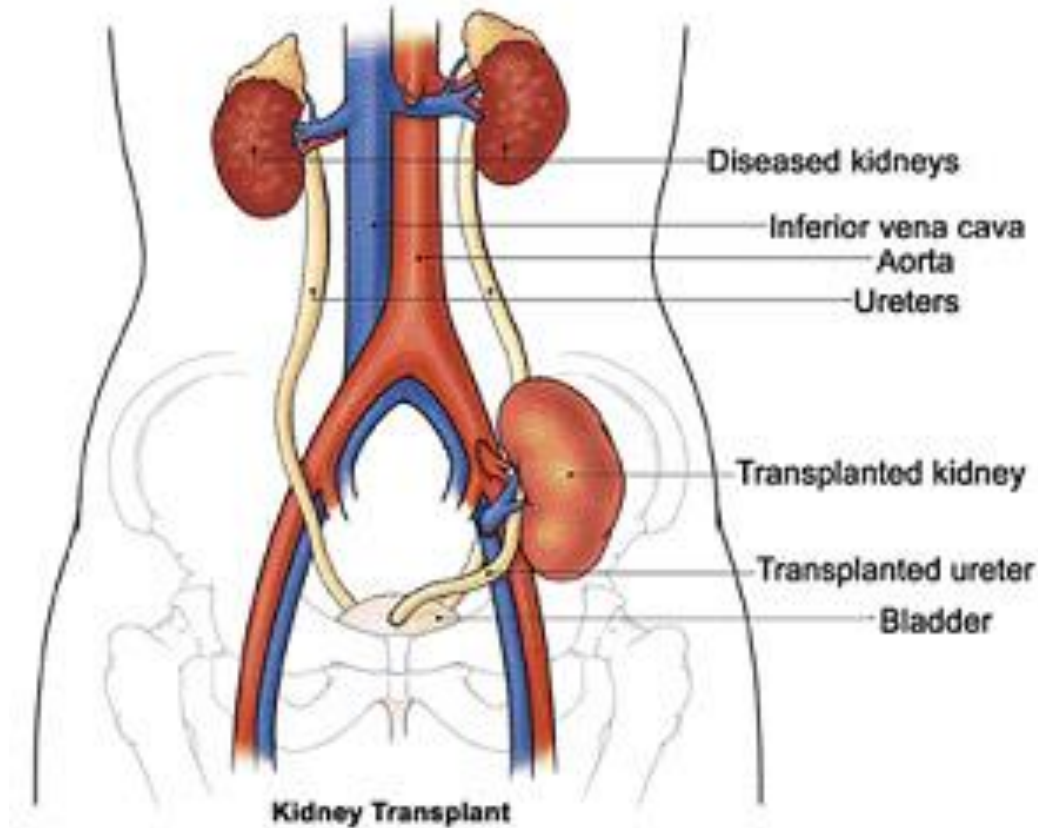
⁷ Department of Medical Microbiology Dokuz Eylül University, Izmir, Turkey

⁸ Department of General Surgery, School of Medicine, Dokuz Eylül University, Izmir, Turkey

Table 1: Demographic and Microbiological characteristics.

Age	Risk faktörleri ✓ Preoperatif albumin düzeyi ✓ Vasküler greft kullanımı ✓ Postoperatif YB yatışı (6 gün ve üzeri) ✓ CAİ varlığı ✓ Reoperasyon									
Gen Fem										
Don (Dec Living										
MEL										
Etiol										
Timi canc										
Candida species	<i>C. guilliermondii</i>	Mortalite % 60					<i>C. albicans</i>	<i>C. albicans</i>	<i>C. albicans</i> + <i>C. glabrata</i>	<i>C. albicans</i>
Mortality	Live	Live	Live	EX	Live	EX	EX	EX	Live	EX

KLİNİK



Renal transplantasyonu - kandidiyazis

Invasive Fungal Infections After Kidney Transplantation: A Single-center Experience

T. Santos^{a,*}, B. Aguiar^a, L. Santos^a, C. Romaozinho^a, R. Tome^b, F. Macario^a, R. Alves^a, M. Campos^a and A. Mota^a

Method. Single-center descriptive study including every kidney transplant recipient with a

2003 Ocak - 2013 Aralık

2156 renal Tx IFI sıklığı % 2.1

45 IFI - 13 IC (*C. albicans* 6)

Tx sonrası 366 (45 - 4431) gün

IC mortalite % 15

(11%) started regular hemodialysis.

Conclusion. IFI still have a high mortality and morbidity in kidney transplant recipients, as verified in this report. We reinforce the need for a high index of suspicion and prompt treatment.

Mycotic Pseudoaneurysm After Kidney Transplantation: Two Case Reports

A. Ministro^{a,b,*}, T. Ferreira^b, L. B.

^aKidney Transplant Unit, Hospital de São
Portugal; and ^bVascular Surgery Depart
Medical Center, Lisbon, Portugal



Arteriovenous graft infection caused by *Candida glabrata*: A case report and literature review

ABSTRACT

Background. Vascu
loss. Here, we describ
transplantation.

Hung-Ling Huang^a, Chun-Yu Lin^{a,b}, Ya-Ting Chang^a,
Yen-Hsu Chen^{a,b}, Wei-Tsung Wu^a, Po-Liang Lu^{a,c,d,*}

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DOI: 10.12659/AJCR.904119
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Case Reports

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Development of Graft-Site Candidiasis in 3 Solid Organ Transplant Recipients from the Same Donor

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D

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BD 2 Daniela C. Kroy
BD 1 Tom Florian Fuller
BC 3 Jürgen Kramer

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Tedavi - Profilaksi

TEDAVI

Clinical Practice Guideline for the Management of Candidiasis: 2016 Update by the Infectious Diseases Society of America

ESCMID PUBLICATIONS

10.1111/1469-0691.12039

ESCMID* guideline for the diagnosis and management of *Candida* diseases 2012: non-neutropenic adult patients

O. A. Cornely^{1†}, M. Bassetti^{2†}, T. Calandra^{3†}, J. Garbino^{4†}, B. J. Kullberg^{5†}, O. Lortholary^{6,7†}, W. Meersseman^{8†}, M. Akova⁹, M. C. Arendrup¹⁰, S. Arikan-Akdogan¹¹, J. Bille³, E. Castagnola¹², M. Cuenca-Estrella¹³, J. P. Donnelly⁵, A. H. Groll⁴, R. Herbrecht¹⁵, W. W. Hope¹⁶, H. E. Jensen¹⁷, C. Lass-Flörl¹⁸, G. Petrikos¹⁹, M. D. Richardson²⁰, E. Roilides²¹, P. E. Verweij⁵, C. Viscoli²² and A. J. Ullmann²³ for the ESCMID Fungal Infection Study Group (EFISG)

REVIEW

10.1111/1469-0691.12660

Invasive fungal infections in solid organ transplant recipients

J. Gavalda¹, Y. Meije¹, J. Fortún², E. Roilides³, F. Saliba⁴, O. Lortholary⁵, P. Muñoz^{6,7,8,9}, P. Grossi¹⁰, M. Cuenca-Estrella¹¹ on behalf of the ESCMID Study Group for Infections in Compromised Hosts (ESGICH)

Solid organ transplant (SOT) recipients have a significant risk of invasive fungal diseases (IFD) caused mainly by *Candida* spp. and *Aspergillus* spp. *Candida* spp. is the most frequent agent of IFD in the transplant recipient. The absence of clinical trials and the epidemiological differences in IFD in different transplant programmes mean that there are no definitive recommendations for the diagnosis, treatment and prevention of IFD in SOT, so most of the evidence must be based on clinical experience.

Keywords: Drug interactions, invasive aspergillosis, invasive candidiasis, solid organ transplantation, Transplant infectious disease

Article published online: 8 May 2014

Clin Microbiol Infect 2014; **20** (Suppl. 7): 27–48

American Journal of Transplantation 2013; **13**: 220–227
Wiley Periodicals Inc.

Special Article

Candida Infections in Solid Organ Transplantation

F. P. Silveira^{a,*}, S. Kusne^b and the AST Infectious Diseases Community of Practice

guilliermondii, an important pathogen in neutropenic hosts, are more common among stem cell transplant recipients, but far less common among organ transplant recipients

Journal of Microbiology, Immunology and Infection (2018) **51**, 1–17



Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.e-jmii.com



Review Article

2016 guidelines for the use of antifungal agents in patients with invasive fungal diseases in Taiwan

Hsiang-Chi Kung^a, Po-Yen Huang^b, Wei-Ting Chen^c, Bor-Sheng Ko^{d,e}, Yee-Chun Chen^{a,e,*}, Shan-Chwen Chang^{a,e}, Yin-Ching Chuang^f on behalf of The Infectious Diseases Society of Taiwan^g, Medical Foundation in Memory of Dr. Deh-Lin

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doi: 10.1111/ajt.12114

The epidemiology and outcomes of invasive *Candida* infections among organ transplant recipients in the United States: results of the Transplant-Associated Infection Surveillance Network (TRANSNET)

David R. Andes¹ | Nasia Safdar¹ | John W. Baddley² | Barbara Alexander³ |

Variable	All species N (%)	<i>C. albicans</i> 296 (46.3)	<i>C. glabrata</i> 156 (24.4)	<i>C. krusei</i> 20 (3.1)	<i>C. parapsilosis</i> 52 (8.1)	<i>C. tropicalis</i> 25 (3.9)
Antifungal therapy						
Triazole	421/639 (65.9)	226/296 (76.4)	83/156 (53.2)	7/20 (35.0)	34/52 (65.4)	17/25 (68.0)
Amphotericin B	182/639 (28.5)	73/296 (24.7)	52/156 (33.3)	7/20 (35.0)	16/52 (30.8)	8/25 (32.0)
Echinocandin	229/639 (35.8)	59/296 (19.9)	85/156 (54.5)	10/20 (50.0)	22/52 (42.3)	12/25 (48.0)



Invasive fungal infections in solid organ transplant recipients

J. Gavalda¹, Y. Meije¹, J. Fortún², E. Roilides³, F. Saliba⁴, O. Lortholary⁵, P. Muñoz^{6,7,8,9}, P. Grossi¹⁰, M. Cuenca-Estrella¹¹ on behalf of the ESCMID Study Group for Infections in Compromised Hosts (ESGICH)

Hot Topics

- Solid organ transplant (SOT) recipients have a significant risk of invasive fungal diseases (IFD) caused mainly by *Candida* spp. and *Aspergillus* spp.
- *Candida* spp. is the most frequent agent of IFD in the transplant recipient
- The absence of clinical trials and the epidemiological differences in IFD in different transplant programmes mean that there are no definitive recommendations for the diagnosis and prevention of IFD in SOT
- Universal prophylaxis against IFD should not be routinely used in renal, liver and heart transplantation. Guided

prophylaxis in high-risk recipients will depend on the risk factors associated with each type of transplant

- Standard treatment of *Candida* infections in transplant recipients is no different from that administered to non-neutropenic patients, although some aspects related to drug–drug interactions and potential toxicities associated with the use of azoles should be considered
- Invasive aspergillosis (IA) in SOT is more a syndrome than an infection. Treatment should be individualized according to type of transplant, SOT recipient, type of IA and immunosuppression used
- Drug–drug interactions involving antifungal drugs should be evaluated very carefully in SOT

Recommendations for the treatment of invasive candidiasis in SOT [78,112].

- Candidaemia:

- In non-neutropenic transplant recipients, initial treatment with echinocandins is strongly recommended (AIII). Alternatively, liposomal amphotericin B can be used despite the risk of nephrotoxicity, especially in kidney transplant recipients (AIII). Fluconazole would be marginally recommended (CIII). Similar recommendations can be given for children with SOT.
- Neutropenia is uncommon in SOT; however, if candidaemia occurs in this context initial treatment with echinocandins or liposomal amphotericin B as fungicidal agents is mandatory (AIII).

Ekinokandinler	AIII
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L. Amp B	AIII
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Flukonazol	CIII
------------	------

Ekinokandinler	AIII
----------------	------

L. Amp B	AIII
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Candida Infections in Solid Organ Transplantation

F. P. Silveira^{a,*}, S. Kusne^b and the AST Infectious Diseases Community of Practice

guilliermondii, an important pathogen in neutropenic hosts, are more common among stem cell transplant recipients, and are more common among solid organ transplant recipients. Therapy

Condition	Primary	Alternative
Candidemia		
Nonneutropenic	Fluconazole 800 mg (12 mg/kg) load, then 400 mg (6 mg/kg) daily ¹ or an echinocandin (I)	LFAmB 3–5 mg/kg daily; or AmB-d 0.5–1 mg/kg daily; for <i>C. krusei</i> and flu-resistant, voriconazole-sensitive <i>C. glabrata</i> , voriconazole 400 mg (6 mg/kg) twice daily for 2 doses, then 200 mg (3 mg/kg) twice daily after initial therapy with an echinocandin
Neutropenic	An echinocandin or LFAmB 3–5 mg/kg daily (II-2)	Fluconazole 800 mg (12 mg/kg) load, then 400 mg (6 mg/kg) daily ¹ ; or voriconazole 400 mg (6mg/kg) twice daily for 2 doses, then 200 mg (3 mg/kg) twice daily

Condition	Therapy	
	Primary	Alternative
Urinary tract infections		
<u>Asymptomatic</u>	Therapy not usually indicated, unless high risk or undergoing urologic procedures	
<u>Symptomatic Cystitis</u>	Fluconazole 200 mg (3 mg/kg) daily ¹ for 2 weeks (III)	AmB-d 0.3–0.6 mg/kg for 1–7 days; or flucytosine (5-FC) 25 mg/kg four times daily ¹ for 7–10 days (III). AmB-d 0.5–0.7 mg/kg daily ± 5-FC 25 mg/kg four times daily ¹
<u>Pyelonephritis</u>	Fluconazole 200–400 mg (3–6 mg/kg) daily ¹ for 2 weeks	
<u>Urinary fungus balls</u>	Surgical removal strongly recommended. Fluconazole 200–400 mg (3–6 mg/kg) daily ¹ or AmB-d 0.5–0.7 mg/kg daily +/–5-FC 25 mg/kg four times daily ¹	



Candida Infections in Solid Organ Transplantation

F. P. Silveira^{a,*}, S. Kusne^b and the AST Infectious Diseases Community of Practice

guilliermondii, an important pathogen in neutropenic hosts, are more common among stem cell transplant recipients,

Condition	Therapy	
	Primary	Alternative
Respiratory candidiasis	Therapy not recommended unless associated with clinical evidence of anastomotic tracheobronchitis	<i>Candida</i> lower respiratory tract infection is rare, even among lung transplant recipients, and it requires histopathologic evidence to confirm a diagnosis

Special Article



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guilliermondii, an important pathogen in neutropenic hosts, are more common among stem cell transplant recipients, but far less common among organ transplant recipients

Table 1: General susceptibility patterns of *Candida* species

Species	Fluconazole	Itraconazole	Voriconazole	Posaconazole	5FC	AmB	Echinocandins
<i>C. albicans</i>	S	S	S	S	S	S	S
<i>C. tropicalis</i>	S	S	S	S	S	S	S
<i>C.parapsilosis</i>	S	S	S	S	S	S	S to R ¹
<i>C. glabrata</i>	S-DD to R	S-DD to R	S-DD to R	S-DD to R	S	S to I	S
<i>C. krusei</i>	R	S-DD to R	S	S	I to R	S to I	S
<i>C. lusitaniae</i>	S	S	S	S	S	S to R	S

AmB = amphotericin B; 5-FC = flucytosine; I = intermediate susceptibility; R = resistant; S = susceptible; S-DD = susceptible dose-dependent.

Profilaksi

- Hangi organ transplantasyonu ?
- Rutin profilaksi ? Hedeflenmiş profilaksi ?
- Hangi etken için - Hangi antifungal ?
- Ne kadar süre ?

Profilaksi



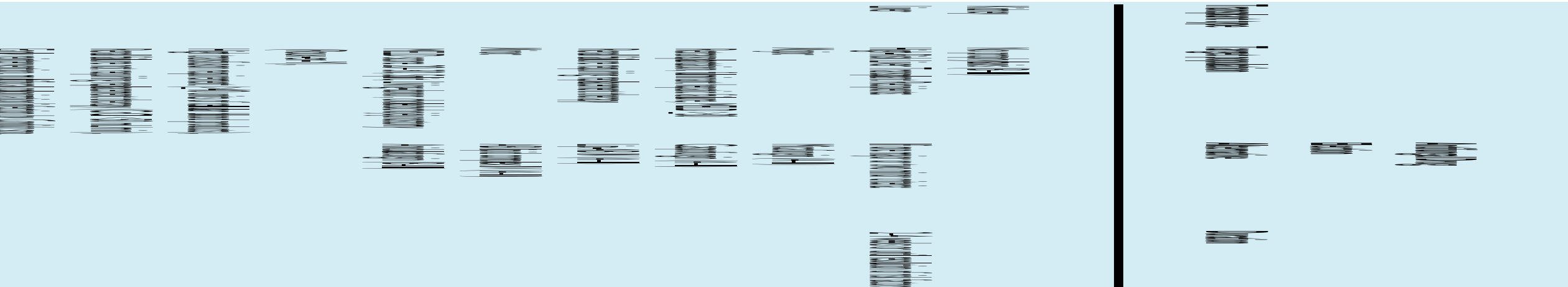
The epidemiology and outcomes of invasive *Candida* infections among organ transplant recipients in the United States: results of the Transplant-Associated Infection Surveillance Network (TRANSNET)

David R. Andes¹ | Nasia Safdar¹ | John W. Baddley² | Barbara Alexander³ |

Variable	All species N (%)	<i>C. albicans</i> 296 (46.3)	<i>C. glabrata</i> 156 (24.4)	<i>C. krusei</i> 20 (3.1)	<i>C. parapsilosis</i> 52 (8.1)	<i>C. tropicalis</i> 25 (3.9)
Antifungal prophylaxis ¹						
Triazole	191/639 (29.9)	62/296 (20.9)	66/156 (42.3)	15/20 (75.0)	18/52 (34.6)	7/25 (28.0)
Amphotericin B	39/639 (6.1)	15/296 (5.1)	9/156 (5.8)	3/20 (15.0)	2/52 (3.8)	4/25 (16.0)
Echinocandin	25/639 (3.9)	9/296 (3.0)	5/156 (3.2)	2/20 (10.0)	6/52 (11.5)	1/25 (4.0)

Invasive fungal infections in solid organ transplant recipients

J. Gavalda¹, Y. Meije¹, J. Fortún², E. Roilides³, F. Saliba⁴, O. Lortholary⁵, P. Muñoz^{6,7,8,9}, P. Grossi¹⁰, M. Cuenca-Estrella¹¹ on behalf of the ESCMID Study Group for Infections in Compromised Hosts (ESGICH)





Candida Infections in Solid Organ Transplantation

F. P. Silveira^{a,*}, S. Kusne^b and the AST Infectious Diseases Community of Practice

guilliermondii, an important pathogen in neutropenic hosts, are more common among stem cell transplant recipients,

Organ	Risk factors	Antifungal prophylaxis	Duration
Liver	Prolonged or repeat operation Retransplantation Renal failure Choledocho-jejunostomy <i>Candida</i> colonization High transfusion requirement	Fluconazole 400 mg/day LFAmB 3–5 mg/kg/day ¹	Up to 4 weeks or Until resolution of risk factors
Small bowel	Graft rejection/dysfunction Enhanced immunosuppression Anastomotic dysruption Abdominal reoperation Multivisceral transplantation	Fluconazole 400 mg/day LFAmB 3–5 mg/kg/day ¹	At least 4 weeks Until healing of anastomosis and absence of rejection
Pancreas	Enteric drainage Vascular thrombosis Postperfusion pancreatitis	Fluconazole 400 mg/day LFAmB 3–5 mg/kg/day ¹	At least 4 weeks

¹ If high rates of non-*albicans* spp or risk factors for *Aspergillus*.

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Solid Organ Transplantasyonu Yapılan Hastalarda Antifungal Profilaksi

Antifungal Prophylaxis in Solid Organ Transplant Recipients

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Öz

Solid organ transplantasyonu (SOT) son dönem organ yetmezliği olan hastaların yaşam kalitesini ve sağkalım süresini arttıran bir tedavi yöntemidir. Bu hasta gruplarına verilen immünsüpresif tedaviler invazif fungal enfeksiyonların (İFİ) gelişmesine yatkınlık oluşturmaktadır. SOT alıcılarında İFİ insidansı, transplante edilen organa bağlı olup %5-42 arasında değişmektedir. Transplant yapılan organa göre değişmekle birlikte en sık izole edilen fungal etken *Candida* spp. olup bunu *Aspergillus* spp. takip etmektedir. Gelişen İFİ'lere bağlı mortalite oranları yüksek olabilmektedir. Bundan dolayı SOT alıcılarında antifungal profilaksi gerekebilir. Randomize kontrollü çalışmaların yetersiz olması nedeniyle birçok transplantasyon merkezi kendi deneyimleri doğrultusunda antifungal stratejilerini belirlemektedir. Tüm SOT alıcılarına antifungal profilaksi uygulanırsa ilaç direnci ve ilaç etkileşimleri gibi durumlar görülebilir. Bu yüzden İFİ gelişme riski yüksek olan kişilerin belirlenmesi gerekir. Bu derlemede karaciğer, böbrek, ince barsak, pankreas, kalp, akciğer transplant alıcılarında İFİ ile ilişkili epidemiyolojik özellikler, risk faktörleri, literatür verileri ve antifungal profilaksi rejimleri derlenmiştir.

Anahtar Kelimeler: Solid organ transplantasyonu, antifungal profilaksi, invazif fungal enfeksiyon, posakonazole, amfoterisin B

Sonuç



- Kandida infeksiyonları en sık (Akciğer transplantasyonu hariç)
- Kandidiazis insidansı transplante edilen organ tipine göre değişir
Bölgesel veri, olgu sunumu, olgu serisi ?
- Klinik bulgular diğer infeksiyonlara benzer, silik
Sistem tutulumu ? Risk faktörleri ?
- Tedavi: Nötropenik olmayan hastalardaki gibi
Anlamlı mortalite ve morbidite ile ilişkili
- Profilaksi rutin değil, Transplantasyon merkezi verileri ?

