

APPENDIX

Answers for multiple-choice questions on diagnosis and treatment of invasive fungal infections*.

Item

CANDIDIASIS

Difference between colonization and infection by *Candida* species

1. Which of the following answers best describes what you would do when faced with *Candida* isolated in a urine culture?
 - a) Systematically start antifungal treatment in all cases.
 - b) Start antifungal treatment if the colony count is $>10^4$ cfu/ml.
 - c) Start antifungal treatment if the colony count is $>10^5$ cfu/ml.
 - d) Start antifungal treatment if the patient has a urinary catheter.
 - e) Start antifungal treatment only in specific cases.**
2. In a patient undergoing mechanical ventilation and with probable ventilator-associated pneumonia (VAP), a tracheal aspirate culture was positive for *Candida* species. Which of the following statements best expresses your interpretation?
 - a) This is a case of colonization; therefore, no antifungal treatment is needed.
 - b) Start treatment with fluconazole, since it is VAP caused by *Candida*.
 - c) Start treatment with an echinocandin, since the VAP was caused by *Candida*.
 - d) Start antifungal treatment only if the patient has a high *Candida* score.**
 - e) Start antifungal treatment if the *Candida* count is $>10^5$ cfu/ml.

Candida prophylaxis

3. In which of the following clinical scenarios would you start *Candida* prophylaxis?
 - a) ICU patient colonized by *Candida*.
 - b) ICU patient not colonized by *Candida* but with a urinary catheter, central venous catheter, and recent surgery.
 - c) Liver transplant recipients with no other risk factors.
 - d) Acute myeloid leukemia patients on induction chemotherapy.**
 - e) All of the above.
4. In your opinion, which of the following is the best choice for *Candida* prophylaxis?
 - a) Fluconazole in most cases.**
 - b) Candins.
 - c) Liposomal amphotericin B.
 - d) Voriconazole.
 - e) None of the above.

Empirical treatment for candidemia

5. In a patient with sepsis possibly caused by a femoral catheter infection, which of the following would you prescribe?
 - a) Treatment against Gram-positive bacteria.
 - b) Treatment against Gram-positive and Gram-negative bacteria.
 - c) Treatment against Gram-positive and Gram-negative bacteria and yeasts.**

- d) Treatment against Gram-negative bacteria.
- e) None of the above. I would remove the catheter and wait for the culture results before starting antifungals.

6. A microbiologist informs you that there are yeasts in the gram stain of a blood culture. Which of the following apply to you?

- a) You start antifungal treatment immediately.**
- b) You wait to see how many bottles it grows in.
- c) You wait for the final microbiological identification.
- d) You remove the catheters and take new blood cultures.
- e) You request cryptococcal serology testing.

7. In a patient with candidemia without severe sepsis, which antifungal agent would be your first choice before knowing the species of *Candida*?

- a) I would wait for the full identification of the microorganism before starting any antifungal agent.
- b) Voriconazole.
- c) An echinocandin or fluconazole.**
- d) Liposomal amphotericin B.
- e) Posaconazole.

Targeted treatment of candidemia

8. Which of the following statements is correct?

- a) *Candida glabrata* can become resistant to fluconazole.
- b) *Candida krusei* is always resistant to fluconazole.
- c) *Candida parapsilosis* is associated with catheter infection.
- d) *Candida albicans* is usually susceptible to fluconazole.
- e) All of the above.**

9. What is the percentage of fluconazole resistance in *Candida* strains isolated from blood cultures at your hospital?

- a) Less than 5%.**
- b) Between 5% and 10%.
- c) Between 10% and 20%.
- d) Between 20% and 30%.
- e) Over 30%.

10. In the treatment of candidemia caused by a fluconazole-susceptible *Candida* species, which of the following would you usually prescribe?

- a) Caspofungin 70 mg on the first day and then 50 mg daily.
- b) Fluconazole 200 mg daily.
- c) Fluconazole 400-800 mg per day depending on the *Candida* species.**
- d) More than 800 mg of fluconazole daily.
- e) None of the above.

11. During the follow-up of candidemic patients, which of the following are recommended?

- a) Obtain blood cultures after 3-7 days of antifungal treatment.
- b) Rule out infective endocarditis by systematic transesophageal echocardiography.
- c) Consider sequential treatment by switching to an oral azole.
- d) Perform funduscopy.
- e) All of the above.**

Indications for amphotericin B, azoles, and candins

12. In which of the following scenarios would L-AmB be your first choice?

- a) In the empirical treatment of candidemia.
- b) In proven invasive aspergillosis.
- c) In unspecified invasive filamentous fungal infection.**
- d) In patients who are intolerant of fluconazole.
- e) In infections due to fluconazole-resistant *Candida*.

13. Which of the following statements is true for treatment with azoles and candins?

- a) Candins can be used as empirical treatment before the antifungal susceptibility of a yeast is known.**
- b) Voriconazole is used to treat infections caused by fluconazole-resistant *Candida* and is preferred to a candin.
- c) Since voriconazole has no significant interactions with other drugs, it is preferred to a candin.
- d) Candins are superior to fluconazole in the treatment of candidemia due to fluconazole-susceptible species.
- e) Posaconazole is the first choice for fluconazole-resistant *Candida*.

INVASIVE ASPERGILLOSIS

Difference between colonization and infection by *Aspergillus* species

14. When *Aspergillus* species is isolated in a respiratory sample, which of the following approaches would you take?

- a) Always start antifungal treatment.
- b) Always start treatment in immunosuppressed patients.
- c) Treat only when the patient has radiological findings in the thoracic CT scan.
- d) Treat when the fungal invasion is confirmed by biopsy.
- e) Treat patients who fulfilled the criteria for proven or probable invasive aspergillosis.**

Diagnosis of invasive aspergillosis

15. Which of the following statements regarding the galactomannan test is false?

- a) It is highly sensitive for neutropenic patients with invasive aspergillosis (cut-off >0.5).
- b) The test has a low sensitivity in solid organ transplant recipients.
- c) Patients receiving some antibiotics could have false-positive test results.

- d) It helps in the follow-up of antifungal treatment.
e) It can only be performed in serum samples.

16. Which of the following are considered radiological findings of invasive aspergillosis?

- a) Presence of dense, well-circumscribed lesions with or without a halo sign in a thoracic CT scan.
b) Presence of a cavity in a thoracic CT scan.
c) Presence of an air-crescent sign in a thoracic CT scan.
d) Sinusitis.
e) All of the above.

Monitoring of antifungal drug level and treatment of aspergillosis

17. In a patient with invasive pulmonary aspergillosis, which antifungal treatment would you choose before antifungal susceptibility data were available?

- a) Voriconazole.**
b) Voriconazole + caspofungin.
c) Liposomal amphotericin B 3 mg/kg/d.
d) Amphotericin B + voriconazole.
e) Liposomal amphotericin B 10 mg/kg/d.

18. What is your opinion on determination of antifungal levels?

- a) Up-to-date guidelines do not recommend systematic determination.
b) It can help to detect underdosing.
c) There is no indication for determination of serum levels of liposomal amphotericin B.
d) It can help to identify azole-related toxicity.
e) All of the above.

19. In your opinion, which are the indications for combined antifungal therapy in invasive aspergillosis?

- a) Invasive pulmonary aspergillosis in patients with chronic obstructive pulmonary disease.
b) Invasive pulmonary aspergillosis in neutropenic patients or transplant recipients.
c) Combination therapy is not supported by clinical evidence (clinical trials).
d) Combination therapy can prove useful in cases associated with non-*fumigatus* *Aspergillus* species.
e) It can only be used as rescue therapy when previous antifungal treatment has failed.

20. In your opinion, which is the correct duration of treatment for solid organ transplant recipients?

- a) 2 weeks.
b) 4-6 weeks.
c) A minimum of 6-12 weeks.
d) 3-6 months.

e) More than 6 months.

***The correct answer is marked in bold.**