

Anti- Fugals Workbook

Match the drug to its mechanism of action

Word Bank:

Voriconazole Terbinafine Caspofungin Flucytosine Amphotericin B

1. It binds to ergosterol causing pore formation and leakage of intracellular contents
Amphotericin B
2. It penetrates to the fungal cell wall where it is converted to fluorouracil which competes with uracil, preventing fungal RNA and protein synthesis
Flucytosine
3. It inhibits ergosterol synthesis, preventing the formation of a functional cell membrane
Voriconazole
4. It inhibits synthesis of beta (1,3)-D-glucan which is an essential component of the fungal cell wall
Caspofungin
5. It inhibits squalene epoxidase, decreasing ergosterol levels
Terbinafine

Identify the Azole

1. Drug of choice for Aspergillus **Voriconazole**
2. Does not cause QT prolongation **Isavuconazonium**
3. Commonly used for vaginal candidiasis **Fluconazole**
4. Caution driving at night due to visual changes **Voriconazole**
5. Active against resistant mold (Mucor and Rhizopus) **Posaconazole, Isavuconazonium**

Fill in the blank - KEY POINTS

1. Amphotericin B Deoxycholate dose should not exceed 1.5 mg/kg/day. Overdose can result in cardiopulmonary arrest
2. Flucytosine use is not recommended for monotherapy due to rapid resistance
3. All azole antifungals have a risk for QT prolongation except Isavuconazonium.
4. All azoles can Increase INR in patients on warfarin.
5. Fluconazole is inherently resistant to Candida Krusei
6. Itraconazole absorption is pH- dependent, increased pH leads to decreased absorption.
7. All azoles are moderate - strong CYP3A4 inhibitors.
8. Visual changes and phototoxicity are major side effects of Voriconazole
9. Amphotericin B has additive risk of nephrotoxicity when used with agents such as aminoglycosides, cisplatin or vancomycin.
10. Flucytosine causes dose-related myelosuppression (anemia, neutropenia, thrombocytopenia)

Multiple choice questions

1. Which of the following statements regarding itraconazole is true?
 - A. It is contraindicated for treatment of onychomycosis in patients with ventricular dysfunction or a history of heart failure**
 - B. It is a pro-drug
 - C. It causes QT shortening
 - D. Acidic environment decreases absorption
 - E. Reduce maintenance doses by 50% for CrCl <50ml/min

2. Which of the following is not a side effect of amphotericin B?
 - A. Infusion reactions
 - B. Nephrotoxicity
 - C. Electrolyte wasting
 - D. Anemia
 - E. None of the above**

3. Which of the following statements regarding Echinocandins is false?
 - A. Echinocandins are available as IV only
 - B. They are dosed once daily
 - C. They are the preferred options for treating Aspergillosis**
 - D. They do not require dose adjustment in renal impairment
 - E. They bind to (1,3)-beta-D-Glucan synthase preventing cell wall synthesis ultimately leading to cell lysis

4. Which of the following has activity against Zygomycetes (Rhizopus, Mucor)?
 - A. Posaconazole**
 - B. Fluconazole
 - C. Micafungin
 - D. Caspofungin
 - E. Voriconazole

5. Which of the following is an important counseling point for patients taking griseofulvin?
 - A. Take on an empty stomach to increase absorption
 - B. Use a non-hormonal form of contraception as this medication may decrease the effectiveness of oral contraceptives**
 - C. Avoid driving at night as this medication may cause vision problems such as blurry vision
 - D. This medication may cause taste and smell disturbances
 - E. A and B

6. Which of the following is the most appropriate agent to treat mild oral candidiasis?
- A. **Nystatin**
 - B. Griseofulvin
 - C. Micafungin
 - D. Itraconazole
 - E. Fluconazole
7. Terry is a 35 year old female currently on treatment with Caspofungin 70 mg IV daily for candidemia. Her recent labs show moderate hepatic impairment and the team has asked you to dose adjust her Caspofungin. What is your recommendation?
- A. Continue 70 mg IV daily
 - B. Discontinue Caspofungin and consider fluconazole
 - C. Switch to Micafungin 100 mg IV daily
 - D. **Reduce dose to 35 mg IV daily**
 - E. Discontinue Caspofungin and initiate amphotericin B
8. Ryan is a 55 year old male who presented with a discolored and thickened nail bed. He complains of extreme pain in the affected nail and has difficulty walking. He is diagnosed with onychomycosis. His PMH includes hypertension, diabetes and heart failure. Which of the following is the most appropriate agent to treat his fungal infection?
- A. **Terbinafine**
 - B. Micafungin
 - C. Itraconazole
 - D. Griseofulvin
 - E. All are appropriate options
9. Which of the following is false regarding amphotericin B?
- A. It is associated with renal toxicity
 - B. Side effects include hypokalemia and hypomagnesemia
 - C. Give acetaminophen, diphenhydramine and saline 30-60 minutes prior to amphotericin B infusion to reduce the rate of infusion-related reactions
 - D. It is active against cryptococcus
 - E. **The lipid formulations have a higher rate of infusion-related reactions compared to the conventional formulation**
10. Which of the following drugs is correctly matched with its side effect?
- A. Caspofungin- Visual disturbances
 - B. **Flucytosine - myelosuppression**
 - C. Isavuconazole - QT prolongation
 - D. Fluconazole - Loss of taste and smell
 - E. Micafungin - Photosensitivity