Cert ID(SA) Phys

THE COLLEGES OF MEDICINE OF SOUTH AFRICA

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Examination for the Subspecialty Certificate in Infectious Diseases of the College of Physicians of South Africa

22 March 2012

1 Paper Only (3 hours)

All questions are to be answered. Each question to be answered in a separate book (or books if more than one is required for the one answer)

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1 You are asked your opinion on antimicrobial selection for a critically ill 58-year-old man with sepsis from a wound infection following a laparotomy. A blood culture is positive, with Gram-positive cocci in clusters (full identification to follow). You recommend vancomycin.

a) Discuss the rationale for a loading dose. What key factor(s) affect the amount given as a loading dose in critical illness? Give an example of another antimicrobial where a loading dose is recommended. (5)

b) Discuss the pros and cons of intermittent dosing versus continuous infusion. (6)

c) When should vancomycin concentrations be measured after intermittent dosing and continuous infusions? (4)

[15]

2 A 55-year-old HIV-infected man with WHO clinical stage 2 HIV and a CD4 count of 360 cells/mm^3 presents for tuberculosis screening. He is asymptomatic and ART-naive. Results of Gene Xpert MTB/RIF on sputum has diagnosed his 18-year-old daughter with whom he lives with pulmonary tuberculosis, which is sensitive to rifampicin.

a) Compare and contrast the tests available for diagnosing latent tuberculosis infection and indicate your choice of test(s) in this patient. (6)

b) Discuss the evidence for the use isoniazid preventive therapy for this patient if you find him not to have active tuberculosis. (6)

c) List 4 drug regimens (together with the duration of therapy) that have been shown to be effective for latent TB in HIV infected adults. (8)

[20]

3 The neonatologist in your hospital seeks your assistance. There are 10 babies in the neonatal ICU, and 4 have positive blood cultures with *Klebsiella pneumoniae*. How would you approach this problem and explain each step you plan to take to establish whether this is an outbreak. If this is an outbreak, how do you plan to control it and prevent future outbreaks? [15]

4 An outbreak of rabies mainly affecting dogs has been confirmed in the farming area of Bergville/Winterton in Kwazulu-Natal. There has been low dog vaccination coverage in the area over several years. There have been a number of serious human exposures. Health professionals have minimal experience with rabies exposure in humans and no rabies cases have been diagnosed in the area.

a) What public health measures would you put in place to prevent human rabies deaths? (4)

b) You have been asked for your opinion on pre-exposure prophylaxis for residents in the area as a possible prevention strategy. (6)

c) What would your approach be to diagnose suspected human cases? (5)

[15]

5 a) Compare the properties of C- reactive protein (CRP) and Procalcitonin (PCT) when used as biomarkers for infection. (5)

b) Discuss the use of biomarkers for infection in a patient with severe sepsis under the following headings

i) Antibiotic use. (5)

ii) Infection prevention and control. (5)

iii) Cost effective patient care. (5)

[20]

6 A 37-year-old woman was diagnosed with HIV in 1996 and started on didanosine (ddI) and stavudine(d4T). In 2000 efavirenz (EFV) was added, but no viral load and CD4 data is available for this period. In 2006, her treatment was changed to zidovudine (AZT), ddI and lopinavir/ritonavir because of presumed virological failure. Her viral load remained detectable throughout follow-up and a resistance genotype was done in March 2010, which showed the following mutations:

NRTI:	M41L, D67N, T215Y, V118I
	Potential low-level resistance to lamivudine (3TC)
	Intermediate resistance to abacavir, d4T, ddI, tenofovir
	High-level resistance to AZT
NNRTI:	None
	Susceptible: EFV, nevirapine, etravirine, rilpivirine
Protease:	Major (M46I, I54V, V82A); Minor (L10F, L24I, L33F)
	Susceptible: darunavir
	Low-level resistance to tipranavir
	Intermediate resistance to saquinavir
	High-level resistance to lopinavir, indinavir, fosamprenavir, nelfinavir

Based on this, her primary care doctor prescribed efavirenz, tenofovir and 3TC. She is referred to you 6 months later with a CD4 count of 98 cells/mm^3 and a viral load of 98000 copies/ml. The only finding on clinical examination is severe lipoatrophy. You perform a 2nd resistance genotype result:

NRTI	Unchanged apart from addition of M184V conferring high-level resistance to 3TC
NNRTI	V106A, F227L, K103N
	High-level resistance to NVP& EFV
	Susceptible ETR and RPV
Protease	Unchanged

Discuss the selection of the antiretroviral regimen by her primary care doctor after the first resistance test. Her employer is prepared to fund the best treatment option available in South Africa. Suggest a management plan for this patient. Justify your choices. [15]