



THE ANARCHY OF ANTIBIOTIC RESISTANCE: MECHANISMS OF BACTERIAL RESISTANCE

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CE QUESTIONS

- Gram-negative bacteria are noteworthy for ____.**
 - rapidly spreading resistance
 - the presence of a single cell wall
 - gaining public attention in the 1960s
 - successful treatment by cephalosporin antibiotics
- Genetic elements that jump from species to species are ____.**
 - only typical of Gram-positive bacteria
 - rarely found in India and Pakistan
 - usually inhibited by antibiotic therapy
 - typical of ESBLs, KPC, and MBLs
- When NDM-1 (an MBL) is compared to CTX-M15 (an ESBL), both ____.**
 - are genes causing resistance to carbapenem antibiotics
 - are carried on plasmids to facilitate transmission
 - are genes causing susceptibility to fluoroquinolones
 - cause out-of-control urinary-tract infection
- Features that best describe NDM-1 include ____.**
 - zinc-dependence, ESBL, resistant to colistin
 - bla_{NDM-1}*, resistant to fluoroquinolones, superbug
 - MBL, resistant to carbapenems, carried on 180-kb plasmid
 - CMY-4, susceptible to carbapenems, carried on 140-kb plasmid
- The patient who often traveled to India was ____.**
 - hospitalized for a urinary-tract infection
 - treated with carbapenem antibiotics for a wound infection
 - treated with amoxicillin for a urinary-tract infection
 - referred to Orebro where an MBL was isolated
- The NDM-1 genetic element encodes multiple genes responsible for ____.**
 - inactivating erythromycin, rifampin, ciprofloxacin, and chloramphenicol
 - urinary-tract infection in hospital and community
 - cephalosporin, penicillin, and carbapenem susceptibility
 - infection only in the U.K., U.S., Greece, and Turkey
- Identification and susceptibility testing of ESBLs and MBLs ____.**
 - is reliable with conventional testing
 - follows testing for all *Enterobacteriaceae*
 - requires testing by an automated system
 - may require double-disk synergy testing
- Differentiating Class A (KPC enzymes) from Class B (metallo-β-lactamases — MBLs) ____.**
 - requires phenotypic double-disk screening test with PCR confirmation
 - requires PCR screening and the E-test
 - is accomplished with the modified Hodge test
 - requires automated susceptibility testing and the E-test.
- Double-disk synergy testing is performed with disk-diffusion using ____.**
 - meropenem or imipenem with PBA and/or EDTA
 - imipenem and the modified Hodge test
 - meropenem and PBA on Mueller-Hinton agar
 - imipenem and EDTA on Mueller-Hinton agar
- Identification of *K pneumoniae* 05-506 was accomplished by ____.**
 - PCR and sequencing at the U.S. Centers for Disease Control and Prevention
 - screening for β-lactamase genes *bla_{CTX}*, *bla_{CMY}*
 - multilocus sequence typing and PFGE
 - the Phoenix and BD automated systems
- Confirmation in the case of *K pneumoniae* 05-506 required ____.**
 - E-test susceptibility strips and disk diffusion.
 - conventional methods and the modified Hodge test
 - the MBL E-test and spectrophotometry for carbapenemase
 - automated systems and PFGE

- Susceptibility testing of 05-506 was performed by ____.**
 - conventional methods
 - E-test susceptibility strips
 - the Phoenix and BD automated systems
 - MBL E-test with imipenem
- Resistance in *E coli* and *K pneumoniae* to vancomycin is ____.**
 - described as typical of *intrinsic* resistance
 - similar to resistance in *Streptococcus pneumoniae*
 - typical of *acquired* bacterial resistance
 - overcome by increasing the dosage of antibiotic
- The major mechanisms of acquired antibiotic resistance ____.**
 - exclude transposons to transfer resistance genes
 - do not affect target sites, e.g. point mutation
 - were not apparent in the NDM-1 case presented
 - include extra-chromosomal plasmids
- Bacterial point mutations are not involved when ____.**
 - β-lactamase genes encode TEM-1 and SHV-1
 - rearranged segments of DNA occurs (case of NDM-1)
 - DNA is acquired from extra chromosomes
 - the ESBLs of *K pneumoniae* and *E coli* are encoded
- The spread of disease by resistant Gram-negative bacteria is exacerbated by ____.**
 - travel to areas of Chennai and Haryana, India
 - the limited availability of non-prescription antibiotics
 - the abundance of new antibiotics
 - selective resistance to penicillin and ampicillin
- Infection-control guidelines are effective unless ____.**
 - extended use of antibiotics is observed
 - hand washing and isolation precautions are lax
 - animals are treated with antibiotics for growth
 - resistant organisms are transmitted in schools
- Reliance on the pharmaceutical industry ____.**
 - will likely resolve the antibiotic-resistance crisis
 - is the only defense against Gram-negative infection
 - limits exploration of new targets for treatment
 - will decrease transmission of CAIs in nursing homes
- Research into a new approach for treating infection ____.**
 - requires no consideration of persister-cell targets
 - presumes that current antibiotic therapy is useful
 - assumes that a new class of antibiotics is effective
 - targets bacterial enzymes to counteract resistance mechanisms
- Since the 1990s outbreaks of HAIs and CAIs are ____.**
 - caused only by Gram-positive bacteria
 - all attributable to carbapenem resistance
 - often carbapenem-resistant ESBLs and MBLs
 - due to a lack of therapeutic agents

TEST ANSWER FORM

CE Test on THE ANARCHY OF ANTIBIOTIC RESISTANCE: MECHANISMS OF BACTERIAL RESISTANCE

May 2011

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