Corynebacterium kroppenstedtii


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ANSWERS TO SELF-ASSESSMENT QUESTIONS

1. Which organism is the most likely pathogen if Gram-positive rods are identified in a wound culture involving breast tissue in a woman with clinical evidence of mastitis?
   (a) Listeria monocytogenes
   (b) Corynebacterium diphtheriae
   (c) Propionibacterium acnes
   (d) Corynebacterium kroppenstedtii

   Answer: d. Corynebacterium species, in particular C. kroppenstedtii, have been described in association with granulomatous mastitis, a rare inflammatory condition that typically affects young women of reproductive age.

2. When Gram-positive diphtheroids are seen in a Gram stain from a wound culture involving breast tissue, what is most likely the optimal medium, culture conditions, and incubation period for the recovery of the potential etiologic agent?
   (a) Blood agar, with the organism grown under anaerobic conditions at 35°C for up to 14 days
   (b) Chocolate agar, with the organism grown in CO2 at 35°C for 3 to 5 days
   (c) 7H11 agar, with the organism grown in ambient air at 30°C for up to 14 days
   (d) Five percent sheep blood agar, with the organism grown in ambient air at 35°C for up to 3 to 5 days

   Answer: d. Corynebacterium species show superior growth on sheep blood-containing medium compared to that on chocolate agar. Incubation on blood agar for 14 days under anaerobic conditions is a standard culture method used to recover Propionibacterium acnes in prosthetic joint infections, but Corynebacterium species are aerobic organisms so will not grow under these conditions. Rapidly growing mycobacteria may cause breast abscesses, especially following breast augmentation or reduction surgery, and will grow best on 7H11 agar incubated aerobically at 30°C; however, in our limited experience, C. kroppenstedtii does not grow on 7H11 medium.

3. Which Corynebacterium species is most likely to be encountered in clinical specimens?
   (a) C. striatum
   (b) C. diphtheriae
   (c) C. jeikeium
   (d) C. urealyticum

   Answer: a. C. striatum is a commensal organism that is part of the microbiome of the skin. Although it is the most commonly recovered Corynebacterium species from clinical specimens, its clinical significance remains poorly understood. C. diphtheriae primarily causes the upper respiratory tract infection known as diphtheria, which is now uncommon due to the diphtheria vaccine. C. jeikeium is an opportunistic pathogen often associated with neutropenic patients with intravascular catheters. C. urealyticum is an emerging opportunistic nosocomial uropathogen which is known to cause urinary tract infections, particularly among renal transplant recipients.

TAKE-HOME POINTS

- New technologies such as MALDI-TOF MS and 16S RNA sequencing are useful tools for identifying new organisms and uncovering poorly described clinical syndromes.
- Clinically significant Corynebacterium species which may be important to report to the species level include C. diphtheriae, C. jeikeium, C. urealyticum, C. kroppenstedtii, and C. magginleyi (in ocular specimens).
- Corynebacterium kroppenstedtii is associated with granulomatous mastitis, typically in young parous women.
- Diagnosing C. kroppenstedtii-associated mastitis is challenging due to the difficulty of detecting or recovering the organism from tissue pathology specimens or from culture media.
- It is important for clinical microbiologists to educate their colleagues about the role of newly recognized organisms in specific clinical syndromes so that these organisms will not be dismissed as merely “contaminants.”