Poster # 1148

Using the Q Score and Q234 Score to Decrease Unnecessary Pathogen Reporting in Wound Cultures

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Abstract (Updated)

Purpose/Background: Wound cultures performed on swabs collected using superficial techniques can easily be contaminated by commensal flora. While there is acceptance that only certain pathogens identified on these cultures are likely to cause true disease, potential pathogen (PP) work-up can vary between labs and even among microbiologists. Southeastern Regional Medical Center (SRMC) does not employ a standardized method for deciding which organisms to report in wound cultures. The literature provides evidence that using the Q score or Q234 score can help microbiology appropriately identify and report likely causative pathogens obtained from a wound infection. Using these methods, potential pathogens and other organisms, including normal flora, do not receive identification (ID) and antimicrobial susceptibility testing (AST). Although the two scoring systems yield different results, both have the potential to reduce the number of pathogens reported at SRMC in a standardized manner.
Methodology: A retrospective evaluation of wound cultures processed by the SRMC microbiology laboratory was conducted for inpatients during the time period of December 28, 2015 to July 31, 2016. Culture and Gram stain results were collected, and Q score, and Q234 score were retrospectively calculated for each culture. The number and type of pathogens receiving ID, and AST was compared for Q score, Q234 score, and actual pathogens worked up by SRMC laboratory.
Results: A total of 80 wound cultures were reviewed during the study period. These wound cultures contained 155 pathogens, other than diptheroids (n=18) and normal flora (n=20), and the SRMC laboratory performed ID and AST on 129 organisms (83.2%). The Q score suggested performing ID and AST on 101 pathogens (65.2%); Q234 score, 92 pathogens (71.3%). A total of 29 organisms (18.7%) considered noninfectious by the literature received ID and AST, and 8 organisms (5.2%) considered infectious only received morphological identification (MID).
Conclusion: Utilizing the Q score or Q234 score for determining PP in wound cultures has the potential to decrease over-reporting of noninfectious pathogens at a community teaching hospital. In addition, education is needed on the relevant potential pathogens to report from wound swabs.

Background

- Wound cultures have high potential for contamination when collected using superficial swabs and SRMC does not have a standardized method for pathogen reporting in wound cultures.
- The Q score and Q234 score can help microbiology appropriately identify and report likely causative pathogens obtained from a wound infection.

Methods

- A retrospective evaluation of wound cultures processed by the SRMC microbiology laboratory was conducted for inpatients during the time period of December 28, 2015 to July 31, 2016.
- Culture and Gram stain results were collected, and Q score, and Q234 score were retrospectively calculated for each culture.
- The Q scoring systems define potential pathogens (PP) as beta-hemolytic streptococci, *Enterococcus* sp., Gram-negative rods, *Bacillus anthracis*, *Staphylococcus aureus*, and yeast. [1]
- The scoring system rejects normal flora from ID and AST, including diptheroids, coagulase-negative staphylococci (CNS), nonpathogenic *Neisseria* species, and alpha- and nonhemolytic streptococci that are commonly found on the skin/mucosal surfaces. [1]

- The Q score is used to determine the number of PP in the culture that should receive work-up. Based on the Q score, up to 3 PP may be worked up from a high quality wound culture (Q3). [1]
- The figure below explains how to use the Q score system to determine PP workup:

Figure 1. Q Score Determination[1]

SRMC reported quantity	Numerical	Presumed cells/lpf
Rare	+/- 1	1-9
Few	+/- 1	1-9
Moderate	+/- 2	10-24
Many	+/- 3	>24

Q Score Determination

WBCs \ SECs (-)	0	-1	-2	-3
0	3	0	0	0
1	3	0	0	0
2	3	1	0	0
3	3	2	1	0

Q score

For the purposes of this analysis, the number of white blood cells (WBC) was used in place of polymorphonuclear neutrophils (PMN) for determining the Q score. Additionally, our facility reports WBC's and squamous epithelial cells (SEC) as rare, few, moderate, and many. For study purposes, we will report those in the quantities shown in Figure 1. Please note that WBC's report as a positive number and SEC's report as a negative number for purposes of determining Q score.

- The Q234 score system is based on the number of PP present in culture and uses the Gram stain if two or more organisms are present to determine a pathogen's significance. The same definitions for PP and normal flora used for the Q score system apply to the Q234 score system. [1]

Figure 2. Using Q Score to Determine PP Workup[1]

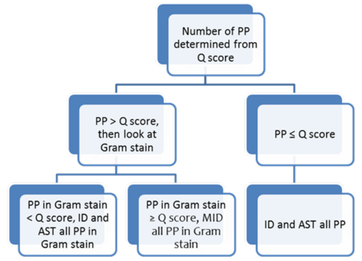
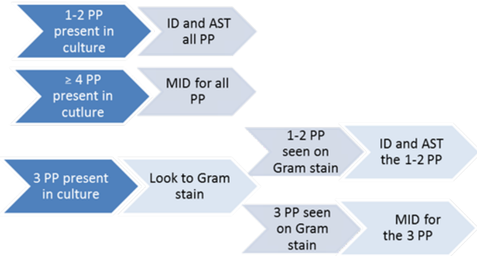


Figure 3. Determining PP Workup Using the Q234 Score System[1]



- The number and type of pathogens receiving ID and AST was compared for Q score, Q234 score, and actual pathogens worked up by SRMC laboratory.
- Antimicrobial therapy potentially used to treat pathogens deemed non-infectious by the scoring systems was also reviewed.

Results

- A total of 80 wound cultures were reviewed during the study period. These wound cultures contained 155 organisms, other than diptheroids and normal flora, and the SRMC laboratory performed ID and AST on 129 organisms (83.2%). The Q score suggested performing ID and AST on 101 pathogens (65.2%); Q234 score, 92 pathogens (71.3%).
- A total of 29 organisms considered noninfectious by the literature received ID and AST, consisting of coagulase-negative staphylococci (n=23), alpha-hemolytic and non-hemolytic streptococci (n=5), and *Globicatella sanguinis*. There were 8 beta-hemolytic streptococci that only received MID, even though they are considered by the literature to be PP.
- Evaluations of antimicrobial therapy prescribed due to ID and AST of inappropriate organisms revealed that 16 of 867 total days of antibiotic days of therapy (1.8%) could have been avoided if these PP had not received a work-up.

Conclusions

- Utilizing the Q score or Q234 score for determining PP in wound cultures has the potential to decrease over-reporting of noninfectious pathogens at a community teaching hospital; however, the ability of either scoring system to meaningfully decrease antibiotic prescribing is doubtful.
- The stewardship team should aid in the development of policies regarding potential pathogens to report from wound swabs, with specific emphasis on infectious and non-infectious staphylococci and streptococci.

1. Matkoski C, Sharp SE, Kiska DL. J Clin Micro. 2006 May 44(5): 1869-72.