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THE SAMPLING CHALLENGE

HOW SHOULD WE DEAL WITH MICROBIOLOGICAL DIAGNOSIS ?

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Question 1. Microbiological sampling and processing in orthopedics and trauma patients with suspect infection may be extremely difficult. Please briefly comment the recent article published by WAIOT focusing on the procedures for microbiological sampling and processing for periprosthetic joint infections (PJIs) and other implant-related infections.

TP: The diagnosis of periprosthetic joint infection is challenging - one of the consistent barriers to diagnosis and reporting of infections is the lack of standardised approach to the microbiological detection and identification of the infecting pathogen. The article published by WAIOT provides a clear outline of the optimal approach to diagnosis of these infections.

EGU: In an effort to advance the field of bone and joint infections, the WAIOT has proposed guidelines for the microbiological diagnosis of orthopaedic implant related infections. The standardization of microbiologic tests from collection, transport, and processing of samples is of great importance. Cultures remain one of the most important tests to confirm the presence of infection, however, culture results are also subjected to great variability. Anything from the quantity and type of samples collected to the duration of incubation of the cultures can have important clinical implications. For example, a culture negative prosthetic joint infection (PJI) in which intraoperative swabs were used for culture collections may reveal a pathogen if collection techniques are optimized for the recovery of organisms.

Multiple groups have proposed a definition of PJI as a quasi “gold standard” that would help the analysis and comparison of clinical research in this area. Culture data is an important criterion of all these PJI definitions, and more emphasis should be made regarding the modifiable variables that could potentially affect the culture results. With these guidelines, WAIOT promotes the most accurate and reliable microbiology methods currently available to improve the diagnosis of implant related orthopedic infections that would then translate into better care of our patients. A standardized microbiological approach could also allow the assessment and comparison of research in implant related bone and joint infections worldwide. We commend the effort of the WAIOT in creating these guidelines which can bring us closer to a more universal definition of PJI.

Question 2. Which is the rate of Methicillin-Resistant *Staphilococci* related to PJIs in your Country or region or hospital? Which approach to decrease or contrast this issue?

TP: 25 - 30% of Staphylococcus aureus is MRSA. 60-70% of coagulase negative staphylococcus are methicillin resistant. All the risk factors for these events are careful checked in our Hospital.

EGU: Methicillin-resistant staphylococci account for 28% of PJI in our institution. To decrease the rate of methicillin resistant staphylococci prosthetic joint infections we focus on decreasing the overall risk of surgical site infections. By addressing modifiable variables such as tobacco use, weight management, glycemic control in diabetic patients, and use of whole body chlorhexidine topical application in the 24 hours prior to surgery, we can decrease the overall risk of surgical site infections including MR-staphylococci. Measures specifically targeted to MRSA infections include MRSA nasal screening for decolonization with mupiricin ointment to the nares and the addition of vancomycin to cephalosporins as perioperative prophylaxis in patients know to be MRSA carriers.

Question 3. Which algorithm do you adopt in case of culture negative in high and low-grade PJIs, respectively?

TP: For treatment in culture negative, we consider fungal and mycobacterial culture. We also perform 16s on specimens for culture negative cases.

EGU: We usually approach low grade and high grade culture negative PJI in a similar manner. However, low-grade infections require more diagnostic studies to detect infection. In high-grade infections, the host inflammatory response against the etiologic agent causing the PJI is such that the diagnosis of infection can be made preoperatively. In general, a detailed history and physical examination is needed to help guide the next steps of testing.

The use of antimicrobials prior to culture collection is an important cause of negative cultures. Epidemiologic and other risk factors for fastidious organisms are important. For example, patients with a history of hypogammaglobulinemia would be at risk for mycoplasma, which requires special media or molecular testing. Also, the use of fungal and mycobacterial cultures would be appropriate in the assessment of culture negative infections. Biofilm techniques and culture of the implant can significantly improve the microbial detection especially in low-grade PJI, where the diagnosis of PJI is more challenging. The use of molecular methods could be considered, however, caution should be exercised in the interpretation of results due to the potential for false positive tests caused by contamination of the samples.

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