EDITORIAL

IMPROVEMENT PROPOSALS FOR CULTURE METHODS TO DIAGNOSIS OF PROSTHETIC JOINT INFECTIONS IN LATIN AMERICA

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Different diagnostic and treatment algorithms for prosthetic infections of the hip and knee are available and widely used in North America. However, for the best of our knowledge, the sampling methodology in Latin American countries is not protocolized varying among the members of the region. In conclusion, we recommend that samples should aim to screen for aerobic, anaerobic, mycobacterial, fungal, and intracellular bacteria. These recommendations are based on experience, especially in Latin America. Further research is necessary for the realization of an international consensus.

Keywords: Latin America; Intraoperative cultures; Surgical site infection; Arthroplasty

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Joint replacement has become one of the most common surgical procedures worldwide, and its occurrence is expected to continue to rise. In 2010, 332.000- total hip and 719.000 total knee arthroplasties were performed in the United States alone.[1] While a small minority of surgeries will become infected, prosthetic joint infections (PJIs) do occur and have a tremendous burden for individual patients as well as the global health care industry. Thus, early and appropriate recognition and management of a different clinical spectrum of PJIs are required to prevent morbidity, especially in elderly patients. For that reason, understanding and improving diagnostic methods have received increasing attention.

Different diagnostic and treatment algorithms for prosthetic infections of the hip and knee are available (American Association of Orthopaedic Surgeons 2010, Infectious Diseases Society of America 2013)[2,3] and widely used in North America. However, for the best of our knowledge, the sampling methodology in Latin American countries is not protocolized, varying among the members of the region and within the same country and in some cases within the same service. Clinical practice guidelines leave out some aspects, and lack of consensus is evident in some specific queries: How? What type of sample? When? Moreover, which culture?

About the first question (How?), initially, we must differentiate between secretions and tissues. In the case of secretions, using an abbocath catheter could be a way to ensure the recollection of the most significant volume of secretion in areas with limited space and avoiding contamination by the surrounding tissues and then injected into two blood culture bottles (aerobic and anaerobic organisms). In the case of tissues, it is common to find membranes adhered to the implant or tissues, transport using sterile gauzes to culture media guarantees the sampling of the highest number of bacterial colonies.[4] Otherwise, in devitalized tissues, there is still controversy about the importance of the isolation of germs in these tissues, given the high rate of colonization, yielding false positives, but in international consensus, sharp dissection should be used instead of cautery, to avoid the thermal lesion and artifacts, that would modify the number of tissue neutrophils and enzymatic tests such as esterase.

To increase the percentage of germ identification, it is necessary to remember that the endemic germs in Latin America vary in species and sensitivity. Although the incidence of PJIs due to fungi is low, they present high morbidity with a requirement for prolonged antibiotic treatment and should be suspected in the epidemiological context of the Americas. The most common are caused by *Candida spp.*, followed in order of frequency by *Paracoccidioides brasiliensis*, *Coccidioides immitis* and *Histoplasma capsulatum*.[5] On the other hand, *Mycobacterium tuberculosis* should also be considered in the etiological diagnosis of PJIs, it is endemic in Bolivia, Peru, Argentina, Brazil, Colombia and recently in Uruguay.[6] For this reason, we suggest taking samples of remaining bone, secretions, muscle, fascia, membranes, and cement (if applicable) in liquid cultures for aerobes, anaerobes, intracellular bacteria, *Mycobacterium tuberculosis,* and fungi.

Another controversy is related to the volume and type of solution needed, The AO Foundation has recently published the correlation based on the sizes of injury in the open fractures based on Gustile and Anderson classification, being the minimum amount of 3 liters of saline solution for lesions smaller than 10 mm and 6 or higher liters for Gustile lesions II/ III, getting lower infection rates with these volumes.[7] Therefore, it could be used as a model to estimate the volume of liquid needed and thus ensure an adequate sweep of detritus and decrease the inoculum. Given that the

detritus, secretion, and bleeding dispersed between the muscular planes could alter the identification, the samples should be taken after washing, when those suspicious-looking tissues could be visually identified, to collect them.

In conclusion, we recommend that samples should aim to screen for aerobic, anaerobic, mycobacterial, fungal, and intracellular bacteria and should be taken after washing and resection of devitalized tissues. It is essential to highlight that these recommendations are based on experience, because there are few studies related to these controversies, especially in Latin America. Further research is necessary for the realization of an international consensus to systematize the procedures in sampling, transport, and volume of washing in this region, which has unique characteristics in terms of epidemiology and availability of resources and materials.

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