TITLE: *Propionibacterium acnes* – STUDY OF A NEGLECTED PATHOGEN IN ORTHOPEDIC IMPLANTS

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ABSTRACT:

Joint replacement is an important strategy in the treatment of various musculoskeletal conditions. Unfortunately, a group of patients will suffer failure within 10 to 15 years following installation of prosthetic devices. The diagnosis and treatment of those infections are a huge challenge for physicians and microbiologists. Among the most prevalent facultative pathogens involved in PJI (50% of cases), is *Staphylococcus spp*. On the other hand, among the anaerobic bacteria, *Propionibacterium acnes* is the most prevalent bacteria, especially because of its ability to produce biofilm. In fact, several studies have shown that this organism is responsible for infections associated with any implant. So, this study aimed to isolate and characterize phenotypically, *P. acnes* strains from clinical specimens of patients with orthopedic implants from the National Institute of Traumatology and Orthopedics (INTO). All samples (66 patients), tissue fragments and implants, were taken to the Anaerobic Biology Laboratory at UFRJ for isolation and identification. Tissue fragments were placed into tubes with thioglycollate broth and glass beads, shaken for 30 sec and incubated for 14 days at 37° C under anaerobic conditions and with subcultures every 3 days in blood agar base plates. Implants were placed in sterile rigid vials with 400 mL of lactated ringer's solution and mechanically shaken for 1 min. Four aliquots of 50 mL were centrifuged for 15 min and pellets seeded in ASS media and thioglycollate. Of 66 patients, 72% presented hip arthroplasty, 19% knee arthroplasty, 7% shoulder implants and 2% spinal implants. *P. acnes* was isolated in 8 patients (12,1%). Of those, 4 presented hip prosthesis and the infection was monomicrobial; in 3 patients with hip prosthesis the infection was polymicrobial, associated with *S. aureus*, *P. aeruginosa*, *S. lugdunensis* e *S warneri.* All strains were isolated after at least 6 days of incubation and until the 14th day, were biofilm producers and showed sensitivity to penicillin, amoxicillin + clavulanic acid and ertapenem. One strain had heteroresistance to vancomycin. Our results highlight the importance of anaerobic infections in orthopedic implants and the urgency of clinical microbiology laboratories being capable of isolating those microorganisms. Besides that, *P. acnes* pathogenicity in those cases should be better elucidated, especially because this bacteria is a member of the normal microbiota and considered a potential contaminant.

Keywords: prosthetic joint, prosthetic joint infection, *Propionibacterium acnes*, biofilm, implant, *Staphylococcus*, *Staphylococcus aureus*