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Elizabeth Morreel

Department of Medical Microbiology, Infectious Disease and Infection prevention, Maastricht UMC+, Maastricht, The Netherlands

Prolonged incubation time unwarranted for acute periprosthetic joint infections

Current laboratory protocols for diagnosing periprosthetic joint infections (PJIs) typically involve a 10- to 14-day incubation period for cultures. However, this timeframe may not be necessary for all cases. We retrospectively reviewed 187 confirmed hip and knee PJIs—each with ≥ 3 intraoperative samples—to assess time to diagnosis (TTD) based on clinical presentation and microbiological methods. PJIs were categorized as early acute ($n=68$), late acute ($n=52$), or late chronic ($n=67$). Nearly all early acute (97.1%) and late acute (98.1%) PJIs were diagnosed within 5 days, compared to 14 days for 97.1% of late chronic infections ($P < 0.004$). These findings suggest that incubation beyond 5 days may be unnecessary for acute presentations. Importantly, enriched liquid media—especially blood culture bottles and sonication fluid—significantly improved detection rates, particularly in polymicrobial and anaerobic infections. Pediatric and anaerobic blood culture bottles outperformed traditional thioglycolate broths, and sonication fluid cultures were critical in confirming the diagnosis in 17.6% of cases. Our findings support a more individualized approach: incubation time should be guided by clinical presentation rather than time since arthroplasty. Shortening the incubation period for acute PJIs could accelerate diagnosis and streamline patient management. Additionally, using blood culture bottles and sonication fluid enhances diagnostic accuracy, especially in complex infections.

Keywords

periprosthetic joint infection, time to diagnosis, acute, chronic, culture, sonication

Biography

Elizabeth Morreel studied medicine in Antwerp from 2013-2019. Subsequently, she started her specialisation as a clinical microbiologist at the MUMC+. In 2023, she also started PhD research within the NWO project DARTBAC, on the topic of optimisation of diagnostics for prosthesis-associated infections. Since 2024, she has been appointed as a staff member within the Department of Medical Microbiology, Infectious Diseases and Infection Prevention at MUMC+, with focus area device and implant related infections.