Microbiological epidemiology depending on time to occurrence of prosthetic joint infection (PJI) : impact on the empirical antimicrobial strategies

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**Aim**

The high microbial diversity and the devastating consequences of an initial therapeutic inaccuracy make the empirical therapy of PJI challenging. Despite the risk of dysbiosis and nephrotoxicity, the vancomycin/piperacillin-tazobactam combination is currently recommended in all cases, even if Gram-negative bacilli (GNB) are probably less represented in late PJI. Therefore, microbiological epidemiology knowledge may help to adapt initial therapeutic strategies according to the chronology of infection.

**Method**

All patients with PJI managed in a reference center for complex bone and joint infections between 2011 and 2016 were included in a prospective cohort study analyzing microbiological data according to the chronology of infection.

PIIs were classified as followed:
- Early: When first symptoms occurred within the year following the surgery
- Late: When first symptoms occurred over the year following the surgery
  - Late acute: Symptoms < 3 weeks AND an obvious exogenous origin
  - Late chronic: Symptoms > 3 weeks, Acute exacerbation of a late chronic PJI: Symptoms < 3 weeks WITHOUT any obvious origin

**Results**

The 567 included PJI concerned mainly hip (n=285; 50.3%) and knee (n=255; 45.0%) prosthesis (216 revision arthroplasty [40.3%]). Early PIs represented 325 (57.3%), late PIs 242 (42.7%) which were divided into late acute (n=59; 10.4%), and late chronic (n=183; 32.3%). Late exacerbated infections were found in 44 (24.0%) of the late chronic PIIs.

**Conclusions**

Considering the minority amount of GNB in late post-operative PJI and the overrepresentation of anaerobes including P. acnes, the empirically use of a broad spectrum betalactam should be reconsidered, especially when a two-stage exchange is planned. In those situations, the vancomycin/clindamycin combination could represent an acceptable alternative.

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**Impact of microbiological etiology of PJI on empirical antimicrobial therapy according to the time to occurrence and the suspected mechanism of infection**