October 4-8 • San Diego, CA • www.idweek.org
IDWeek 2017
P212

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 microbiological 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.

PJIs were classified as followed:

- Early : When first symptoms occured within the year following the surgery
- Late : When first symptoms occured 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

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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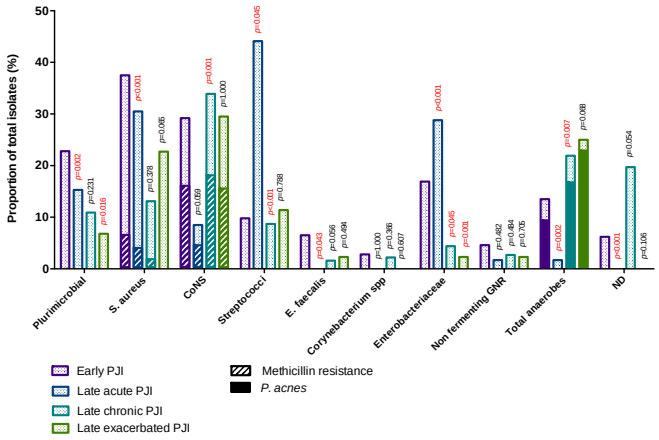
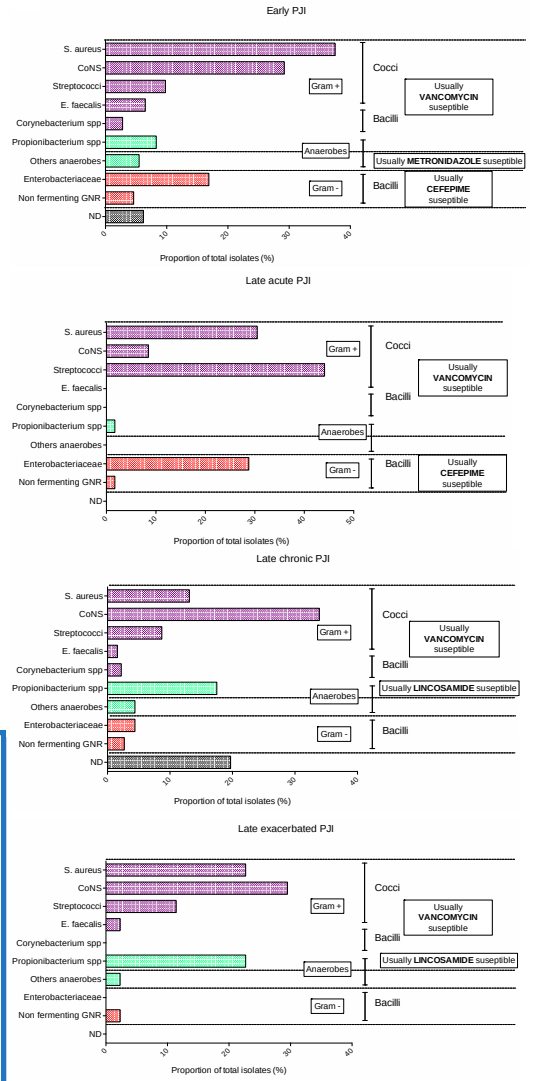
Results

The 567 included PJI concerned mainly hip (n=285; 50.3%) and knee (n=255; 45.0%) prosthesis (216 revision arthroplasty [40.3%]). Early PJIs represented 325 (57.3%), late PJIs 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 PJIs.



PJI microbiology according time to occurrence, comparison between early and late PJI documentation
PJI : Prosthetic joint infection, S. aureus : Staphylococcus aureus, CoNS : Coagulase Negative Staphylococci, GNR : Gram Negative rods, ND : non documented



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

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