P2524 Preoperative cultures of synovial fluid poorly predict the intraoperatively-detected pathogen in PJI

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Background: Surgical and antimicrobial treatment of periprosthetic joint infections (PJI) depends on the causative pathogen. We aimed at assessing the concordance of preoperative synovial fluid and intraoperative samples harvested during revision surgery in patients with PJI.

Materials/methods: We retrospectively assessed PJI cases treated at our institution from 02/2011 to 02/2018, for which culture results from preoperative (synovial fluid) and intraoperative samples (periprosthetic tissue, synovial or sonication fluid) were available. For organisms belonging to the resident skin flora (coagulase-negative staphylococci, cutibacteria and corynebacteria) significant growth was considered, if the identical pathogen grew in ≥2 samples or >50 cfu/ml sonication fluid. For other pathogens (S. aureus, streptococci, enterococci, fungi and gram-negative rods) or patients under antimicrobials, any growth was considered positive. We determined the pathogen detection rate in preoperative and intraoperative cultures and calculated their concordance.

Results: We included 143 culture-positive PJI cases (69 hip and 74 knee joints). Coagulase-negative staphylococci (n=49, 34%), S. aureus (n=30, 21%) and streptococci (n=20, 14%) were the most common pathogens. In 15 cases (10%), polymicrobial infection was found. The pathogen(s) grew in synovial fluid in 91 cases and in intraoperative samples in 130 cases (64% vs. 91%, p<0.001). No differences were observed comparing hip and knee prostheses, primary and revision prostheses or patients receiving or not receiving antibiotics before sampling. Congruent results of preoperative and intraoperative cultures were found in 49% (70 cases). In 13 cases (9%), the pathogen was detected preoperatively only, in 51 cases (36%) the pathogen was found intraoperatively only; in 3 cases an additional pathogen was found preoperatively, in 6 cases an additional organism was found intraoperatively. Pathogen detection was significantly better in intraoperative compared to preoperative cultures in low-virulent pathogens (63% vs 31%, p=0.0002), polymicrobial infections (67% vs. 13%, p=0.008) and delayed/late PJI (>3 months; 92% vs 62%, p<0.0001, concordance 48%). There was no difference regarding detection rate of high-virulent pathogens (90% vs 82%, p=0.367) and in early postoperative PJI (<3 months, 88% vs. 75%, p=0.654).

Conclusions: As concordance of preoperative and intraoperative microbiological results was <50%, surgical and antimicrobial treatment should not be selected based on preoperative synovial fluid cultures only.