Periprosthetic Joint Infection in Patients with Multiple Arthroplasties: New Insights for Metachronous Periprosthetic Joint Infections

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INTRODUCTION:
There is no agreed time interval which defines a metachronous PJI manifestation, there are a wide variation in the literature between a few months and several years postoperatively. There is also no compelling evidence currently regarding the rate of incidence, risk factors and timing of metachronous infections. The aims of this study are to answer following questions: 1) What is the rate of metachronous infection in our institution? 2) What are the risk factors for developing metachronous infection in patients with more than one prosthesis at the time of primary PJI? Is the time interval of metachronous infection development different according to the localization of the multipe arthroplasties?
METHODS: During January 2010 and December 2018, 71 patients developed a metachronous PJI after a mean time interval of 49.5 months. The remaining patients were chosen as controls. Diagnosis of the PJI including the metachronous PJI were made according to the MSIS criteria. To identify patient-related risk factors for a metachronous PJI, following parameters were analyzed: gender; age; BMI and pre-existing conditions (diabetes, rheumatoid arthritis, immune-modulating therapy, chronic kidney disease, and a history of neoplasia of any kind). The metachronous infections are divided into 3 groups: group 1: metachronous infections in the same extremity; group 2: metachronous infections of the other extremity; group 3: metachronous infections of the lower extremity and upper extremity. We identified 32 PJI cases in group 1, 38 PJI cases in group 2 and 1 PJI case in group 3.
RESULTS: Diabetes mellitus was found higher in the metachronous infections. The rate of same side infection was significantly higher compared to the contralateral infection and upper and lower infection. The time interval of metachronous infection development was faster in same side infections. Same bacteria sample rate between primary PJI and metachronous PJI in same side infections (21/32) was also significantly higher than in the contralateral PJI group (13/38, $p<0.05$).
DISCUSSION AND CONCLUSION:
The findings of this study suggest that the risk of metachronous infection is high, particularly in the case of prostheses on the same side. There are currently no defined protocols for the follow up of other prostheses in patients who have PJI. Our findings suggest that the risk of metachronous PJI is higher in some populations and from the type of bacterium isolated intraoperatively to primary PJI. Further studies are needed to establish whether these patients may require more prolonged antibiotic therapy to eradicate possible bacteraemia, particularly for high virulence bacteria or for polymicrobial cultures.