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### [O109] UTILITY OF GENE EXPRESSION PATTERN OF TOLL-LIKE RECEPTORS AND IL-1/IL1R FAMILY FOR ASSESSMENT OF PERIPROSTHETIC JOINT INFECTION IN TOTAL JOINT ARTHROPLASTY

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**Aim:** The diagnosis of periprosthetic joint infection (PJI) in total joint arthroplasty (TJA) remains a serious clinical challenge. Nowadays, limited biomarkers associated with PJI are available. We investigated therefore the utility of gene expression pattern of Toll-like receptors (TLR) and members of interleukin (IL)1/IL1R family, molecules critically involved in the innate immune response to invading pathogens, for detecting PJI in periprosthetic tissues around TJA.

**Method:** Periprosthetic tissues were collected from 37 patients presenting with PJI and 39 patients having an aseptic failure of TJA. mRNA expression of known TLR receptors (TLR1-10) and 21 members of IL-1/IL-1R family was investigated using an innovative Smartchip Real-Time RT-PCR System\*; the data were normalized relative to the housekeeping gene GAPDH. Statistical tests were performed using GraphPad Prism\* and bio-data mining methods.

**Results:** In PJI, elevated mRNA expression levels of TLR1 ( $P=0.03$ ), TLR4 ( $P=0.01$ ) and TLR6 ( $P=0.01$ ) were detected when compared to tissues from aseptic cases. On the contrary, lower mRNA expression of TLR3 ( $P=0.04$ ) and TLR7 ( $P=0.047$ ) were detected in PJI than in aseptic loosening. From IL1/IL-1R family, PJI was associated with elevated levels of IL1 $\beta$  ( $P=0.0004$ ), IL1RN ( $P=0.05$ ), IL1R1 ( $P=0.04$ ), IL1R2 ( $P=0.01$ ), and IL18RAP ( $P=0.02$ ) comparing to aseptic failure. Multivariate analysis and sophisticated bio-data mining analysis are ongoing to determine the potential of TLRs and IL1/IL1R family as biomarkers of PJI in TJA.

**Conclusions:** Tissue expression of TLRs and IL1/IL-1R family differ in terms of pattern and expression level between septic and aseptic failure of TJA. Our data support the potential of “innate gene” expression panel as candidate biomarker for assessment of PJI. Further studies are required to replicate our data and also to enable valid interpretation of our findings.

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