

O0690 Evaluation of lipocalin-2 as a biomarker of periprosthetic joint infection

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Background: The current diagnosis of periprosthetic joint infection (PJI) remains a serious clinical challenge. Synovial fluid biomarkers are a novel approach to identify rapid diagnostic tests and may be used to optimise clinical treatment. The ability to distinguish between septic and aseptic failure of the prosthesis is critical, as the treatment for PJI necessitates unique surgical strategies to eradicate the infecting organism. We evaluated the use of lipocalin-2 (LCN2), a well-characterised neutrophil protein, as a synovial fluid biomarker for the diagnosis of PJI.

Materials/methods: Consecutive samples from 72 patients attending a tertiary 700-bed teaching hospital with proven infection (N=22), sterile inflammation (N=22) and controls (N=28) were collected and analysed using a modified enzyme immunoassay coupled with chemiluminescence (Architect). We analysed the diagnostic performance of LCN2 in these groups by logistic regression analysis and area under the ROC curve (AUROC).

Results: We found that the median (IQR) concentration of LCN2 was 1536.5 ng/mL (12923.0 – 261.8) in the infection group, 87.0 (135.0 – 54.8) in the group with sterile inflammation and 55.0 (67.8 – 45.0) in control group. LCN2 discriminated nearly perfectly between controls and confirmed infection (0.98 AUROC, 95%CI: 0.95-1.00). The optimal cut-off value for maximal sensitivity (86.4%) and specificity (77.3%) was 151.3 ng/mL. The AUROC to discriminate sterile vs proven infection was 0.92, 95%CI: 0.84-0.99.

Conclusions: LCN2 is a potential novel biomarker that may be helpful to inform surgical teams on the potential risk of PJI and optimise specific surgical interventions as it distinguishes between septic and aseptic failure of prosthesis with high sensitivity and specificity. Prospective validation should follow the potential impact of this biomarker in different clinical settings.