Utility of Synovial Fluid Biomarkers in Diagnosing Periprosthetic Joint Infection: Disparities in Single Sample Synovial Fluid Sent to Separate Centers

Authors:
Kevin X. Farley, BS, Atlanta, GA, UNITED STATES
Albert T. Anastasio, BA, Atlanta, GA, UNITED STATES
Gregory Kurkis, MD, Atlanta, GA, UNITED STATES
George N. Guild, MD, Atlanta, GA, UNITED STATES
Department of Orthopaedic Surgery
Emory University, Atlanta GA
Disclosures

The authors have no financial conflicts to disclose
Summary: We aim to identify incongruity between the laboratories affiliated with our institution and an outside laboratory.
Introduction

- The diagnosis of prosthetic joint infection (PJI) remains a challenge, and reliance on standard synovial fluid analysis can result in false positives or negatives.

- To appropriately diagnose PJI, the authors at our institution have sent the same synovial fluid sample to both a University Laboratory (UL) and an Outside Laboratory (OL) for synovial fluid testing.

- Hypothesis: The reliance on standard analysis without OL testing may result in inaccurate diagnosis and management.
Study Design

- Patients were identified from our institution's database as having had the same synovial fluid evaluated by both the UL and the OL.

- The accuracy of each lab was confirmed utilizing the MSIS definition for PJI.

- Statistical significance for categorical variables was tested using the chi-square method and the Wilcoxon rank-sum procedure for continuous variables.
Results: Sample

- Data from 62 patients who had the same synovial fluid sample sent to both the OL and the UL were obtained.
- 14.3% of the samples were obtained from hips and 85.7% of the samples were obtained from knees.
Results

• A Wilcoxon signed-ranks test indicated that the UL values for synovial nucleated cell count (mean=9,637+/-19,534) was significantly lower than the OL (mean=17,415+/-29,786; p<.0001).

• There was no difference in synovial nucleated cell percentage in the UL versus the OL (60.24% versus 57.73%, p=.663).
Results

• Of 62 cultures, 63.9% (n=39) were in agreement. Of those 62, the OL diagnosed 9 (14.5%) as a positive culture that the UL labeled as a negative culture.

• 2 cultures were positive from the UL but negative from the OL. 12 (19.3%) cultures were in agreement for culture positivity. These discrepancies were statistically significant (p<.0001).
Conclusions: Main Take Away Points

• Due to the incongruence between the UL and the OL, sole reliance on one laboratory value may result in inaccurate diagnosis and treatment.

• Given the important role of synovial fluid biomarkers in the classification of PJI, this discrepancy between the synovial fluid measurements must be addressed.
References