**α-Defensin**

A novel synovial fluid biomarker that outperforms leukocyte esterase when diagnosing periprosthetic joint infection

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**Introduction**

- The diagnosis of periprosthetic joint infection remains a challenge.
- α-Defensins are a class of antimicrobial peptides that are secreted by WBCs in response to a pathogen. The α-defensin peptide interacts with the pathogen’s cell membrane, causing depolarization and rapid killing of the pathogen.

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**Results**

- Synovial fluid α-defensin correctly predicted the MSIS classification of all patients in the study, with a sensitivity and specificity of 100%.
- α-Defensin levels among patients with PJI (59.6 ug/L) were 60-fold higher than those patients with an aseptic joint (0.986 ug/L).

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**Methods**

- Synovial fluid was collected prospectively from patients being evaluated for revision TKA or THA.
- The MSIS criteria were used to classify 23 PJIs and 23 aseptic cases.
- Synovial fluid samples were tested for α-defensin by immunoassay and also for leukocyte esterase (LE) by the colorimetric test strip.
- The diagnostic threshold for α-defensin was set at 5.2 ug/L.
- The LE test strip was interpreted as positive for PJI at a reading of “2+” on the colorimetric strip.

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**Conclusions**

- The synovial fluid α-defensin immunoassay outperforms the LE colorimetric strip test.
- The synovial fluid α-defensin immunoassay provided a result for all patients, whereas the LE strip test was unreadable in 17% of samples.
- The α-defensin immunoassay can provide an objective, analytic, and highly accurate method of diagnosing PJI.