Paper #16

The Alpha-Defensin Test Provides Incremental Benefit to the Traditional Tests for Periprosthetic Joint Infection⁽⁾

Notes

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Introduction: How should we interpret an alpha-defensin (AD) test in the context of other available traditional laboratory data? The purpose of this study is to determine how the AD test result changes the likelihood of a positive culture, when considered in the context of the fluid WBC count, neutrophil%, and CRP.

Methods: We retrospectively identified 8382 synovial fluid samples, aspirated from hip and knee arthroplasties, which had a complete set of synovial fluid laboratories. When a synovial fluid's WBC count, neutrophil%, and CRP were all negative for PJI, it was placed in the group "ALLNEG"(N=4872). When a synovial fluid's WBC count, neutrophil%, and CRP were all positive for PJI, it was placed in the group "ALLPOS"(N=1299). When a synovial fluid's WBC count, neutrophil%, and CRP yielded mixed results for PJI, it was placed in the group "MIXED"(N=2211). We then assessed how the AD result (positive or negative) altered the likelihood of a (+)culture in these different groups.

Results: The AD test, when interpreted in the context of the other laboratory results, had a significant effect on the likelihood of a (+)culture. Among the ALLNEG group, a (+)culture was 6.5-fold more likely when the AD test was positive rather than negative (5.1% vs. 0.8% culture positive; p<0.004). Among the MIXED group, a (+)culture was 13.8-fold more likely when the AD test was positive (36.1% vs. 2.6% culture positive; p<0.0001). Among the ALLPOS group, a (+)culture was 5.1-fold more likely when the AD test was positive (64.7% vs. 12.8% culture positive; p<0.0001).

Conclusions: The AD test has a quite marked effect on the likelihood of a positive culture when considered in addition to the traditional test results. This improved predictive value for positive cultures is not only realized when the traditional tests are equivocal, but also when the traditional tests are all aligned toward one diagnosis. Consideration should be given to the utilization of the AD test whenever an arthroplasty is aspirated to diagnose PJI.

⁶The FDA has not cleared the pharmaceuticals and/or medical devices listed here: synovial fluid CRP