

12 Best Papers

[O123] SYNOVIAL FLUID TESTING FOR THE DIAGNOSIS OF PROSTHETIC JOINT INFECTION – IMPROVING ITS DIAGNOSTIC ACCURACY WITH SIMPLE AND INEXPENSIVE BIOMARKERS

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Aim: Our goal is to increase diagnostic accuracy of synovial fluid testing in differentiating prosthetic joint infection(PJI) by more exhaustively studying simple and inexpensive biomarkers. For that purpose, we sought to determine: 1)if synovial fluid C-reactive protein(CRP), alpha-2-macroglobulin(A2M), procalcitonin and adenosine deaminase(ADA) concentrations are different between infected and aseptic cases; 2)performance and optimal cutoff values of each marker; 3)whether any such test may help improve diagnostic performance of traditional leukocyte count.

Method: Between January/2013 and December/2015 total hip or knee arthroplasty revision cases (regardless of preoperative diagnosis) were prospectively included provided enough synovial fluid for biomarker analysis was collected and at least four tissue samples as well as the implant for sonication were gathered for microbiological study. Definitive diagnosis was classified as infection or aseptic on the basis of the recent International Consensus Meeting definition of PJI. Using receiver operating characteristic curves, we determined cutoff values as well as sensitivity and specificity for each marker.

Results: Fifty-five out of 143 revision arthroplasties fully respected the inclusion criteria. Two supposedly aseptic cases were ultimately classified as infected resulting in 32 aseptic and 23 infected cases available for analysis. Total leukocyte count, proportion of PMN, C-reactive protein, ADA and alpha-2-macroglobulin but not procalcitonin were significantly different between both groups. Cutoff values for optimal performance in the diagnosis of infection were: total leukocyte count >1,463 cells/ μ L; proportion of PMN >81%; CRP >6.7mg/L and ADA >61U/L. Table 1 shows diagnostic accuracy parameters for each such marker as well as several different possible combinations of results.

Conclusions: Synovial fluid leukocyte count offers great negative predictive value and interpreting it together with other more specific markers such as C-reactive protein and ADA is helpful in improving its positive predictive value. These simple and inexpensive markers may reduce the number of equivocal synovial fluid results requiring more expensive investigation.

	Proposed cutoff	Sensitivity (95% CI)	Specificity (95% CI)	Positive Predictive Value	Negative Predictive Value
Total leukocyte count (cells/ μ L)	1,463	100.0% (100.0 to 100.0)	71.9% (60.0 to 83.8)	71.9% (60.0 to 83.8)	100% (100.0 to 100.0)
Proportion of PMN (%)	81%	78.3% (67.4 to 89.2)	75.0% (63.6 to 86.4)	69.2%(57.0 to 81.4)	82.8%(72.8 to 92.7)
C-reactive protein (mg/L)	6.7	78.3% (67.4 to 89.2)	93.8% (87.4 to 100.0)	90.0% (82.1 to 97.9)	85.7%(76.5 to 95.0)
ADA (U/L)	61	78.3% (67.4 to 89.2)	96.9% (92.3 to 100.0)	94.7% (88.8 to 100.0)	86.1%(77.0 to 95.2)
Leukocyte count > 1,463 OR PMN> 81%		100.0% (100.0 to 100.0)	71.9% (60.0 to 83.8)	71.9% (60.0 to 83.8)	100% (100.0 to 100.0)
Leukocyte count > 1,463 AND PMN> 81%		78.3% (67.4 to 89.2)	75.0% (63.6 to 86.4)	69.2% (60.0 to 83.8)	82.8% (72.8 to 92.7)
Leukocyte count > 1,463 OR CRP > 6.7		100.0% (100.0 to 100.0)	65.6% (53.1 to 78.2)	67.6% (55.3 to 80.0)	100.0% (100.0 to 100.0)
Leukocyte count > 1,463 AND CRP > 6.7		78.3% (67.4 to 89.2)	100.0% (100.0 to 100.0)	100.0% (100.0 to 100.0)	86.5% (77.4 to 95.5)
Leukocyte count > 1,463 OR ADA > 61		100.0% (100.0 to 100.0)	71.9% (60.0 to 83.8)	71.9% (60.0 to 83.8)	100.0% (100.0 to 100.0)
Leukocyte count > 1,463 AND ADA > 61		78.3% (67.4 to 89.2)	96.9% (92.3 to 100.0)	94.7% (88.8 to 100.0)	86.1% (77.0 to 95.2)
PMN> 81% OR CRP > 6.7		95.6% (90.3 to 100.0)	68.8% (56.5 to 81.0)	95.6% (90.3 to 100.0)	68.8% (56.5 to 81.0)
PMN> 81% AND CRP > 6.7		60.9% (48.0 to 73.8)	75.0% (63.6 to 86.4)	74.4% (60.6 to 84.2)	78.0% (67.1 to 89.0)
PMN> 81% OR ADA > 61		91.3% (83.9 to 98.7)	68.8% (56.5 to 81.0)	95.6% (90.3 to 100.0)	92.3% (85.3 to 99.3)
PMN> 81% AND ADA > 61		65.2% (52.6 to 77.8)	96.9% (92.3 to 100.0)	93.8% (87.3 to 100.0)	79.5% (68.8 to 90.2)