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Can synovial S-tream level help to differentiate between septic and nonseptic arthritis

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Objective: to evaluate the usefulness of STREM-1 level in synovial fluid (SF) to differentiate between septic and no septic arthritis

Methods: A cross sectional study performed in the Department of Pediatrics, Rasoul Hospital, Tehran, IRAN between 2008 and 2009. Cases included 66 children with arthritis.Upon 53 adequate synovial fluid (SF) aspirated from cases direct gram stain, conventional and Bactec culture, quantification of STREM-1 level (EIA Quantikine, R&D systems, USA) had done. Septic arthritis diagnosed in 26 cases (18 positive culture; 8 positive gram stain) .The most common Organisms was S.Aureus:7/18 (38%).The STREM-1 levels compared between seotic (n=26) and aseptic (n=27) arthritis. Chi square values (CI 95 %, $p<0.05$) were considered statistically significant.

Results: Cut off level 825 pg./ml for SF-STREM-1 yielded 50% sensitivity, 70% specificity,64 % Positive Predictive Value (PPV), 64%, Negative Predictive Value (NPV). Poor agreement observed between SF -STREM-1 levels and positive SF culture (P value: 0.056; Kappa=0.2).The area under the ROC curve for discriminating between septic and aseptic arthritis was 0.603 (95% CI; 0.448-0.757, P = 0.2) SF -STREM-1 Levels were higher in patients with bacterial arthritis in compare with aseptic arthritis (95% Confidence Interval Odds Ratio9.852-1.039; fisher exact test; P value: 0.056)

Conclusion: SF-STREM-1 level even in very low amount (825 pg/ml) had intermediate (50%) sensitivity for diagnosis of septic arthritis. 70% specificity is excellent and sufficient for definite diagnosis, but it could misdiagnosed just in 30% of septic arthritis cases (from other inflammatory arthritis). In deed, 64%Negative Predictive Value for the test is a limited factor. In our opinion the presence of STREM-1 in SFA can potentially assist clinicians in the diagnosis of half but not all cases with bacterial arthritis. The Positive SF culture as gold-standard test for diagnosis would obtain up to 80 %. Combination of new biologic markers (PCT and sTREM-1) in SFA could be more helpful in high suspicious cases with negative culture (outpatient cases were already on antibiotic treatment; or normally under growth of SF culture). A larger group of patients needed to be studied to confirm our findings.

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