

## Does This Adult Patient Have Septic Arthritis?

**Margaretten ME, Kohlwes J, Moore D, Bent S JAMA 2007;297:1478-1488**

**Problem:** A 58 yo male with a hx of Rheumatoid arthritis is admitted with an acutely painful and swollen left knee. He is on Naproxen, Azathioprine and Prednisone. He is febrile (38.5C), BP 160/90 mmHg. Left knee cannot be moved because of severe pain. Knee exhibits large effusion and is diffusely tender with erythema around the joint. Joint aspiration yields 20 ml opaque, yellow fluid with low viscosity. Synovial fluid WBC is 70,000 with 98% PMNs. Synovial crystal fluid analysis is negative. Gram positive cocci on gram's stain of the synovial fluid. Fluid is sent for culture.

**Finding the paper:** DynaMed database using the terms: "arthritis", "infectious arthritis", "diagnosis"

**Type of Study:** Systematic Review & Meta-analysis of 14 articles from PubMed and EMBASE (1966-2007)

**Question:** Accuracy & precision of the clinical evaluation in diagnosis of non-gonococcal bacterial arthritis

**Relevance:** The destructive nature of septic arthritis on the joint as well as high mortality even with antibiotic treatment.

### **Method:**

P: Patients who presented with an acutely painful or swollen joint and had data describing the History and/or physical exam and/or lab data (serum or synovial fluid) in diagnosing septic arthritis. 14 studies involving 6242 patients met this criteria.

I: Gold standard tests of synovial fluid cultures, positive gram stains, positive blood cultures, macroscopic pus aspiration from joint, response to antibiotics

C: No control or comparison

O: Likelihood ratio (LR) for all symptoms and signs used to diagnosis septic arthritis. The sensitivity, specificity, positive and negative LR as well as summary LR were calculated.

### **Critical Appraisal:**

The study question, and search methodology are clearly outlined for reproducibility. Inclusion criteria was appropriate for septic arthritis. Most of the included studies were of low quality (only 3/14 studies were a score 1 study). Most studies were a quality score 3-5. Almost half (6/14) studies were a level IV evidence.. Unable to exclude gonococcal arthritis from the study results. Results were fairly similar.

### **Results:**

#### **Risk factors:**

a) Age > 80 yo: LR 3.5; CI 1.8-7.0, Sn 19 Sp 95 RR 4.1; (b) Diabetes: LR 2.7; CI 1.0-6.9, Sn 12 Sp 96 RR 2.8

c) RA: LR 2.5, CI 2.0-3.1, Sn 68 Sp 73 RR 5.4 (d) Recent joint surgery: LR 6.9, CI 3.8-12.0, Sn 24 Sp 96 RR 8.4

e) Hip or knee prosthesis and skin infection: LR 15, CI 8.1-28, Sn 24, Sp 98 RR 18

**Sx and Signs:** Joint pain Sn 85%, joint edema Sn 78%; fever Sn 57%; Sweats Sn 27%; Rigors Sn 19%

**Labs:** synovial WBC < 25,000 LR 0.32, >25,000 LR 2.9, >50,000 LR 7.7, >100,000 LR 28

synovial PMN: >90% LR 3.4 CI 2.8-4.2), <90% LR 0.34 CI 0.25-0.47

**Limitations:** Lack of high-quality studies, difficulty in obtaining gold standard, some studies included patients with Neisseria gonorrhoea.

**Applicability:** In a patient with a painful swollen joint, the risk factors and joint aspiration results provide useful information for diagnosing septic arthritis. Symptoms and physical exam are not very helpful.