



Synovial Fluid CRP

Compiled by Drs. J Wojno & M Bezuidenhout

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Synovial fluid is a viscous liquid found in joints that acts as a lubricant and shock absorber. C-reactive protein (CRP) is an acute-phase protein that is produced by the liver in response to inflammation. When a prosthetic joint becomes infected, fluid can accumulate in the joint space and there may be an increase in synovial fluid CRP levels.

Prosthetic joint infection (PJI) is a serious complication that can occur after joint replacement surgery, and can cause 25% of failed knee arthroplasties and 15% of failed hip arthroplasties.¹ When the obvious diagnostic features of infection, according to the Musculoskeletal Infection Society (MSIS)¹ and Clinical Practice Guidelines by the Infectious Diseases Society of America² are not always present, there may be a need to consider additional investigations. The two diagnostic features of PJI include a sinus tract communicating with the prosthesis, or two tissue samples that grow the same organism. However, these features of PJI are not always present.

As current diagnostic methods for PJI may not always be accurate, leading to a delay in treatment and potential complications, synovial fluid CRP has emerged as a promising biomarker for diagnosing PJI.

The diagnosis of PJI, especially with organisms of low virulence such as *Cutibacterium acnes* and *Staphylococcus epidermidis* can be challenging as serum inflammatory markers may be normal. It is thus not surprising that clinicians have developed tools that consider clinical, histological, microbiological and biochemical scores to make the diagnosis. One of the biochemical markers used in the MSIS scoring system is synovial fluid CRP.

Several studies have shown that synovial fluid CRP is a sensitive and specific biomarker for diagnosing PJI. One meta-analysis found that synovial fluid CRP had a sensitivity of 88%, and a specificity of 93% for diagnosing PJI.³ Another study found that synovial fluid CRP had a sensitivity of 86%, and a specificity of 97% for diagnosing PJI.⁴

The synovial fluid CRP cut-off used by the MSIS for diagnosis of PJI is 12.2 µg/mL. This gave a sensitivity of 90% and specificity of 97% (95% CI 73 – 98).¹

Overall, the use of synovial fluid CRP as a diagnostic tool for PJI shows promise and may help improve the accuracy and speed of diagnosis, leading to better patient outcomes.

References

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