

Clinical Effectiveness of Serum D-Dimer in Evaluating Periprosthetic Joint Infections (PJI)

Intro:

PJIs are a dreaded complication of total hip and knee arthroplasty. Criteria have been proposed with the 2018 ICM criteria including d-dimer as a screening test. This study aims to investigate the accuracy of D-dimer in diagnosing PJI, and its impact on ordering additional tests, including VTE assessments or aspirations that were triggered by the result. D-dimer will be compared to the accuracy of more commonly ordered tests, such as a sedimentation rate (ESR) and c-reactive protein (CRP).

Methods:

A retrospective review of prospectively collected data was performed to include 216 consecutive patients who were being worked-up for a painful arthroplasty. 154 patients were being assessed after a primary arthroplasty and 62 subsequent to a revision procedure. All patients that had a D-dimer, ESR and CRP ordered were included. Concomitant tests obtained included synovial WBC count, PMN%, and intraoperative histology when indicated. General patient demographics and follow-up testing were recorded.

Results:

Of the 216 patients, 111 were found to have a positive D-dimer ($>860 \mu\text{g/L}$). There were 21 PJIs, affording a sensitivity of 100%, specificity of 53.8%, PPV of 18.9% and NPV of 100%. Of the 21 PJI patients, 15 had all three screening tests return positive (per ICM cutoffs) and all 21 had at least an ESR and/or CRP positive. 0 patients only had D-dimer positive. At least 3 lower extremity dopplers and 1 chest CTA were ordered by other providers in response to the positive D-dimer, all of which were negative.

Conclusion:

While D-dimer testing proves to have high sensitivity, its additional contribution to PJI screening does not unveil further PJI cases that CRP and ESR would not detect alone. This lack of contribution to screening should be evaluated alongside its poor specificity which may contribute to unnecessary joint aspirations along with additional expensive testing.