

Preoperatively Elevated ESR and CRP in Total Knee Arthroplasty

Background

Erythrocyte Sedimentation Rate (ESR) and C-Reactive Protein (CRP) are two serum measures of inflammation that can be used to diagnose periprosthetic joint infection and to assess treatment efficacy by monitoring trends in improvement. Currently most physicians do not obtain inflammatory markers as a baseline pre-operatively to help assess potential post-operative infections. Furthermore, the diagnostic as well as prognostic efficacy of ESR and CRP can be distorted if their levels are unknowingly elevated. The purpose of this study was to define the prevalence of preoperatively elevated ESR and CRP levels within a cohort of otherwise healthy patients undergoing primary Total Knee Arthroplasty.

Methods

The medical records of a single surgeon cohort of primary total knee arthroplasty patients from October 2009 to May 2011 were retrospectively reviewed. The primary surgeon began collecting ESR and CRP as part of the pre-operative assessment in 2009. Patients with complete pre-operative blood work including CBC, ESR, and CRP drawn within 30 days prior to index procedure were included. Elevated ESR in a patient older than 50 years was defined in males as > 20 mm/hr and in females as > 30mm/hr, and elevated CRP was defined as > 8.2 mg/dL. An initial evaluation of pre-operative inflammatory markers was then made in all patients to determine the overall prevalence of elevated ESR and CRP. Patients were then excluded if they had concomitant medical conditions known to elevate inflammatory markers. Finally, the prevalence of idiopathically elevated ESR and CRP levels were determined in this patient cohort.

Results

We included 94 patients in our original cohort and determined the overall preoperative prevalence of elevated ESR to be 41.5% and elevated CRP to be 28.7%. We then excluded all patients with known inflammatory states such as UTI, Rheumatoid Arthritis, Hepatitis-C, Crohn's Disease, and Systemic Lupus Erythematosus. This left 78 healthy patients to determine the prevalence of idiopathically elevated inflammatory markers. Idiopathically, ESR was elevated in 38.5% and CRP was elevated in 26.9% of patients.

Conclusion

This study identifies a significant number of otherwise healthy patients undergoing TKA with elevated inflammatory markers. If ESR and CRP levels are to be used as effective diagnostic and prognostic tools then their baseline values must first be determined in each individual patient. Due to the number of comorbidities in this population and the subsequent effects they may have on baseline inflammatory markers, the assumption that ESR and CRP are normal in otherwise healthy patients undergoing TKA may be inappropriate. Further studies to correlate pre-operative inflammatory markers with outcomes are needed. Additional studies to help define a threshold for infection based on the patient's baseline characteristics may be helpful in further defining when periprosthetic joint infection is occurring.