Analysis of Albumin Levels as a Continuous Variable on Postoperative Outcomes following Total Joint Arthroplasty

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INTRODUCTION: Suboptimal nutritional status has been linked to poor outcomes within orthopedics. Low serum albumin levels have been associated with complications following total joint arthroplasty (TJA) procedures. This study aims to determine a cut-off value to predict postoperative complications following primary total hip (THA) and knee (TKA) arthroplasty.

METHODS: Patients undergoing primary TJAs by multiple surgeons between 2016-2023 at a single, academic medical center were reviewed. All revision surgeries or TJA for malignancy or fracture were excluded. Area Under the Curve analysis and multivariate regression modeling was performed to determine the sensitivity and specificity of various albumin levels at predicting any complication, revision surgery and readmission.

RESULTS: 1,908 patients were included, of which 1,087 (56.9%) underwent TKA and 821 (43.1%) THA. The mean overall preoperative albumin level was 4.03 ± 0.38 g/dL. The overall complication, readmission and revision rate was 6.7%, 3.1% and 2.3%, respectively. Albumin level < 3.8 g/dL was associated with an increased risk of complications following TJA(OR 1.56 [1.08-2.25]; p=0.018). Albumin level <3.5 g/dL was found to be 91.9% specific for any complication following THA, whereas an albumin level <3.6 g/dL was found to be 85.7% and 85.8% specific for readmission and revision and revision surgery following TKA.

DISCUSSION AND CONCLUSION: Albumin levels <3.8 g/dL acts as a cutoff for overall complications in TJA, with lower albumin of < 3.5 g/dL and <3.6 g/dL being highly specific for complications in THA and readmission and revision surgery following TKA respectively. Greater numbers may elucidate values that require further optimization prior to TJA.