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Can Serum Albumin Predict Procedure-Related Complications in Total Shoulder Arthroplasty?

Introduction:Serum albumin, a low-cost test, evaluates nutritional and organ function and predicts adverse surgical outcomes. This study examines the link between preoperative serum albumin levels and procedure-related complications (PRC) in total shoulder arthroplasty (TSA) patients. Methods:A retrospective cohort study was performed using the National Surgical Quality Improvement Program (NSQIP) database of TSA cases occurring between 2012-2021. Inclusion criteria was age ≥18 years. Patients were categorized by preoperative albumin levels: severe hypoalbuminemia (<3 mg/dL), mild hypoalbuminemia (3–3.49 mg/dL), normal (3.5–4.49 mg/dL), and hyperalbuminemia (≥4.5 mg/dL). The primary outcome was procedure-related complications, including mechanical issues, periprosthetic joint infection, myocardial infarction, sepsis, septic shock, pneumonia, pulmonary embolism, and wound infections. Univariate analysis compared cohorts, while multivariable regression, adjusted for confounders, examined the link between preoperative albumin levels and PRCs. Results:During the study, 18,044 patients underwent TSA. Most in the hypoalbuminemia and normal albumin cohorts were 70–79 years old, female, White, non-Hispanic, independent, ASA class 3, obese, and without smoking history, diabetes, or immunosuppressive therapy. In contrast, the hyperalbuminemia cohort had the highest proportion of patients aged 60–69, male, and ASA class <3 [Table 1]. Multivariable regression, adjusted for confounders, showed increased PRC risk in TSA patients with severe (OR: 2.75, 95% CI 1.45–4.87; p<0.001) and mild (OR: 1.55, 95% CI 1.01–2.30; p=0.035) hypoalbuminemia compared to those with normal albumin[Table 2]. No association was found between preoperative hyperalbuminemia and PRCs. Conclusion:Patients with low preoperative albumin undergoing TSA face a higher risk of procedure-related complications. Further research on albumin management and perioperative support for these patients may improve outcomes.