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Systematic Review And Meta-Analysis Of Hypoalbuminemia And Total Knee, Hip, Shoulder, And Joint Arthroplasty

Introduction: Preoperative serum albumin is widely associated with post-total joint arthroplasty(TJA) complications; however, effect sizes significantly vary. As current literature is limited in retrospective design, heterogeneity, and small sample size, we assessed the predictive value of preoperative hypoalbuminemia on post-TJA readmission, reoperation, and mortality.
Methods: PubMed, Embase, Ovid, CENTRAL, the trial register, and SCOPUS were searched. Retrospective, prospective, observational studies, or randomized controlled trials including primary TJA patients with preoperative albumin levels and outcomes of interest were identified. We performed subgroup analyses of adult total hip(THA), knee(TKA), and shoulder arthroplasty(TSA).
Results: Twenty-one studies with 605,942 patients were analyzed. Hypoalbuminemia(<3.5 g/dL) showed 3.93, 2.20, and 1.99-fold odds of mortality(OR=3.93, 95% CI=2.56-6.05), reoperation levels(OR=2.20, 95% CI=1.73-2.81), and readmission(OR=1.99, 95% CI=1.66-2.39). Reoperation, readmission, and mortality respectively showed significant heterogeneity($I2$=90%; 78%; 95%).
Hypoalbuminemia showed 2.01, 1.88, and 1.30-fold odds of readmission among TKA(OR=2.01, 95% CI=1.62-2.50), TSA(OR=1.88, 95% CI=0.58-6.12), and THA(OR=1.30, 95% CI=1.19-1.42), respectively. Hypoalbuminemia showed 3.60, 2.67, and 1.70-fold odds of reoperation among TSA(OR=3.60, 95% CI=1.84-7.03), TKA(OR=2.67, 95% CI=1.38-5.16), and THA(OR=1.70, 95% CI=1.22-2.38) patients. Hypoalbuminemia showed 14.57, 6.06, and 3.96-fold odds of mortality among TSA(OR=14.57, 95% CI=2.10-101.14), THA(OR=6.06, 95% CI=2.05-17.90), and TKA(OR=3.96, 95% CI=1.78-8.83) patients.
Conclusion: Preoperative albumin can predict readmission, reoperation, and mortality among primary TJA procedures, but sub-procedures have large variable effect sizes. Furthermore, the vast heterogeneity among TJA analyses indicates that solely using a preoperative albumin threshold requires further prospective evaluation.