Serum Albumin and Prealbumin and Associated Risk of Postoperative Complications after Total Hip Arthroplasty

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INTRODUCTION:

Poor nutritional status, identified by hypoalbuminemia, has been associated with adverse postoperative outcomes following total hip arthroplasty (THA). Prealbumin, with a shorter half-life relative to albumin, may have greater efficacy for operative risk prediction. This study investigates the association of serum albumin and prealbumin with 90-day and 1-year complications following THA.

METHODS:

A retrospective review identified 2,750 patients who underwent primary THA between 2012–2024 at a single institution. After excluding 927 patients with missing preoperative lab data, a final cohort of 1,823 patients was analyzed. Patients were categorized by albumin and prealbumin levels: hypoalbuminemia (<3.5 g/dL) vs. normal albumin (≥3.5 g/dL), severe low prealbumin (<15 mg/dL) vs. normal prealbumin (≥15 mg/dL), and low prealbumin (<20 mg/dL) vs. normal prealbumin (≥20 mg/dL). The primary outcome was postoperative medical or surgical complications at 90 days and 1 year. Adjusted odds ratios (aOR) were obtained using multivariable logistic regression controlling for age, sex, body mass index (BMI), and American society of Anesthesiology classification (ASA), presented with and 95% confidence intervals [95% CI].

RESULTS:

Compared to patients with normal albumin, those with hypoalbuminemia were associated with increased risk of complications at 90 days (aOR = 1.76 [95% CI: 1.14 to 2.72, $P = 0.01$]) and 1 year (aOR = 1.66 [95% CI: 1.14 to 2.41, $P = 0.01$]). Compared to patients with normal prealbumin, those with severe low prealbumin were not associated with an increased risk of complications at 90 days (aOR = 1.02 [0.35 to 2.96, $P = 0.97$]) or 1 year (aOR = 1.21 [0.52 - 2.81, $P = 0.65$]). Finally, compared to patients who had normal prealbumin, those with low prealbumin were not associated with increased risk of complications at 90 days (aOR = 1.03 [95% CI: 0.6 to 1.75, $P = 0.92$]) and 1 year (aOR = 1.36 [95% CI: 0.9 to 2.06, $P = 0.15$]).

DISCUSSION AND CONCLUSION:

Hypoalbuminemia, but not prealbumin, was associated with increased postoperative complications following THA. This suggests that preoperative albumin, rather than prealbumin, is a more effective screening tool for assessing surgical risk in THA patients.