

# Enhancing Predictive Precision: Onodera's Prognostic Nutritional Index Outperforms Serum Albumin in Predicting Infection Risk After TKA

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## INTRODUCTION:

The assessment of nutritional status before total knee arthroplasty (TKA) is crucial for predicting postoperative outcomes. However, the ideal marker for evaluating nutritional status in this context remains uncertain. Traditional markers such as serum albumin levels have been used. Still, recent studies suggest that Onodera's prognostic nutritional index (OPNI) may offer superior predictive accuracy due to its incorporation of both serum albumin levels and lymphocyte count. This study aims to investigate the utility of OPNI in predicting early complications following TKA and how it compares to serum albumin levels.

## METHODS:

This prospective multi-center study evaluated primary TKAs. The OPNI was measured in patients within 14 days of surgery. Complications were assessed for 12 weeks from surgery and included prosthetic joint infection (PJI), wound complications, re-admission, and re-operation. The Youden's index was used to determine the cut-off for OPNI and albumin. Multiple regression model was also performed using the Charlson comorbidity index to compare the outcomes using OPNI and albumin levels as independent variables.

## RESULTS:

Overall, 1,325 patients (562 males, 763 females) were included in the study. OPNI cutoff score of 45.1 was determined as the optimal threshold associated with complications. Patients with lower OPNI (<45.1) were 9.8 times more likely to develop PJI compared to patients with higher OPNI ( $p=0.001$ ). Re-admission and re-operation rates were 4.6 and 4.2 times higher in patients with OPNI below the threshold ( $p = 0.017$  and  $p = 0.005$ , respectively). These complications remained statistically significant in multiple regression analysis. Unlike OPNI, albumin failed to show a significant association with complications (cutoff: 38.2 g/L). Moreover, 27% of patients who had normal albumin, but low OPNI developed complications.

## DISCUSSION AND CONCLUSION:

The Onodera's Prognostic Nutritional Index (OPNI) has proven to be a superior predictor of postoperative complications following total knee arthroplasty (TKA). Our study confirms that OPNI provides a more precise reflection of a patient's nutritional status and offers key insights into their metabolic state, effectively distinguishing between anabolic and catabolic state. Importantly, our findings in line with previous studies demonstrated that standard serum albumin levels do not reliably indicate nutritional optimization. Therefore, OPNI not only surpasses traditional markers in predicting complications but also serves as a more accurate gauge of nutritional adequacy. We strongly recommend the routine preoperative screening of all TKA patients using OPNI, particularly for those with scores below 45.1. For these patients, a comprehensive risk-benefit analysis of the surgical intervention should be coupled with targeted nutritional optimization to enhance surgical outcomes and patient safety.