JANUAR 2018

Serum Fructosamine: A Simple and Inexpensive Test for Assessing Preoperative Glycemic Control

Shoat N et al

JBJS 2017; 15;99(22):1900-1907

Background: Although the medical community acknowledges the importance of preoperative glycemic control, the literature is inconclusive and the proper metric for assessment of glycemic control remains unclear. Serum fructosamine reflects the mean glycemic control in a shorter time period compared with glycated hemoglobin (HbA1c). Our aim was to examine its role in predicting adverse outcomes following total joint arthroplasty.

Methods: Between 2012 and 2013, we screened all patients undergoing total joint arthroplasty preoperatively using serum HbA1c, fructosamine, and blood glucose levels. On the basis of the recommendations of the American Diabetes Association, 7% was chosen as the cutoff for HbA1c being indicative of poor glycemic control. This threshold correlated with a fructosamine level of 292 mmol/L. All patients were followed and total joint arthroplasty complications were evaluated. We were particularly interested in retrieving details on surgical-site infection (superficial and deep). Patients with fructosamine levels of ‡292 mmol/L were compared with those with fructosamine levels of <292 mmol/L. Complications were evaluated in a univariate analysis followed by a stepwise logistic regression analysis.

Results: A total of 829 patients undergoing primary total joint arthroplasty were included in the present study.There were 119 patients (14.4%) with a history of diabetes and 308 patients (37.2%) with HbA1c levels in the prediabetic range. Overall, 51 patients had fructosamine levels of ‡292 mmol/L. Twenty patients (39.2%) had a fructosamine level of ‡292 mmol/L but did not have an HbA1c level of ‡7%. Patients with fructosamine levels of ‡292 mmol/L had a significantly higher risk for deep infection (adjusted odds ratio [OR], 6.2 [95% confidence interval (CI), 1.6 to 24.0]; p = 0.009), readmission (adjusted OR, 3.0 [95% CI, 1.1 to 8.1]; p = 0.03), and reoperation (adjusted OR, 3.4 [95% CI, 1.2 to 9.2]; p = 0.02). In the current study with the given sample size, HbA1c levels of ‡7% failed to show any significant correlation with deep infection (p = 0.14), readmission (p = 1.0), or reoperation (p = 0.7).

Conclusions: Serum fructosamine is a simple and inexpensive test that appears to be a good predictor of adverse outcome in patients with known diabetes and those with unrecognized diabetes or hyperglycemia. Our findings suggest that fructosamine can serve as an alternative to HbA1c in the setting of preoperative glycemic assessment.

Level of Evidence: Prognostic Level III.

Søren Ohrt-Nissen