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Blood urea nitrogen increase is an expected finding in nonvariceal upper GI bleeding patients with underlying moderate or severe renal disease

To the Editor:

In a recent article, Kumar et al[1] studied the association between increased blood urea nitrogen (BUN) at 24 hours and outcomes in nonvariceal upper GI bleeding in a retrospective study design. The authors speculated that a BUN increase within 24 hours of admission could be a risk factor for worse outcomes, as observed in acute pancreatitis by Wu et al.[2] Their study cohort included 357 patients. Of those, 320 (90%) experienced a decrease or no change in BUN, whereas 37 patients (10%) had an increase in BUN at 24 hours after admission. The authors detected an increased risk of worse outcomes in the increased BUN cohort. Then an increase in BUN was found to be an independent predictor of the composite outcome in the logistic regression model by the authors. However, that group contained a significantly higher incidence of moderate or severe renal disease (27% vs 4.%; $P < .001$).

At this point, early BUN elevation could make sense only in patients with upper GI bleeding and no previous renal disease. But underlying moderate or severe renal disease is a clearly defined risk factor for upper GI bleeding,[3] with increase in rebleeding and other adverse events. If the authors had defined increased BUN at 24 hours in patients with previously normal renal functioning, then BUN could be considered a poor prognostic factor in upper GI bleeding. But underlying moderate or severe renal disease is already a known significant risk factor for patiens with bleeding, and it is obvious to expect a BUN increase in this patient group.

Ibrahim Hakkı Köker, MD
Gastroenterology Department
Faculty of Medicine
Bezmialem Vakif University
Istanbul, Turkey

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Response:

We thank Dr Köker for his interest in our study, "Association between an increase in blood urea nitrogen at 24 hours and worse outcomes in acute nonvariceal upper GI bleeding."[1] In his letter to the editor, the author notes that renal disease is an independent risk factor for upper GI bleeding (UGIB). Given that blood urea nitrogen (BUN) elevations are more likely to be seen in patients with renal disease, the author expresses concern that the findings of our study were driven by the patients with moderate or severe renal disease in our study sample.

Indeed, renal disease has been shown to be an independent risk factor for upper GI bleeding. A large retrospective study using the Nationwide Inpatient Sample found that patients with chronic kidney disease and end-stage renal disease had a significantly higher risk of admission for UGIB and a higher associated all-cause mortality rate than did patients without any renal disease.[2] For this reason, we thought it was important to control for the presence of renal disease in our analysis, and we thus identified all patients in our study cohort who met the criteria for moderate or several renal disease according to the Charlson Comorbidity Index.[3] Although a greater proportion of patients with moderate or severe renal disease in the group had a rising BUN level at 24 hours, an increase in BUN persisted as an independent predictor of the composite outcome (odds ratio [OR] 3.0; $P = .021$) even after inclusion of the presence of renal disease in the logistic regression model.

Given the concerns raised by the letter that the results of the study were influenced by the inclusion of patients with moderate or severe renal disease, we repeated the analysis with only the patients who had no evidence of renal disease (n = 335). In this logistic regression analysis, the rise in BUN again proved to be an independent risk factor for the development of our composite outcome (OR 2.9; $P = .041$). Independent of underlying renal disease status, our findings thus suggest that a rise in BUN at 24 hours is a significant predictor of poor outcomes in acute nonvariceal UGIB. In addition to identifying a solitary predictor, the association of a rise in BUN with worse outcomes also highlights the importance of adequate volume resuscitation early in the disease course of acute nonvariceal UGIB.

Navin L. Kumar, MD
Division of Gastroenterology, Hepatology and Endoscopy
Brigham and Women's Hospital
Harvard Medical School
Brian L. Claggett, PhD
Harvard Medical School
John R. Saltzman, MD
Division of Gastroenterology, Hepatology and Endoscopy
Brigham and Women's Hospital
Harvard Medical School
Boston, Massachusetts