A multicentre review of acute upper gastrointestinal bleeding; a raised urea:creatinine ratio aids diagnosis

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Introduction

Risk scoring for acute upper gastrointestinal bleeding (AUGIB) is key when assessing patients for requiring oesophagogastroduodenoscopy (OGD). The Rockall score utilises age, comorbidities and shock. The Glasgow-Blatchford score (GBS), in addition, utilises haemoglobin, melaena and blood urea levels.

Raised blood urea levels can represent digestion of blood from the upper gastrointestinal tract giving rise to melaena; the presence of both gives a high GBS. However, inexperienced healthcare professionals can misinterpret the absence/presence of melaena, raised urea levels may be due to kidney injury. Nevertheless, gastroenterologists may use urea to diagnose AUGIB if patients haven't had overt/witnessed/reliably reported haematemesis or melaena.

It has been shown that a raised urea:creatinine ratio (URCR) can be associated with AUGIB and may be superior to urea alone as it mitigates for kidney injury.[1] However, URCR is not widely used in the UK in the assessment of AUGIB. We aim to assess the association of urea and URCR levels with AUGIB.

Methods

A retrospective review at three UK centres (Kettering General Hospital, Queen Elizabeth Hospital Birmingham and University Hospital Coventry & Warwickshire) was undertaken. Endoscopy reports and blood tests were reviewed of patients undergoing inpatient OGD for suspected AUGIB within 2017/8; data were recorded in an Excel spreadsheet. URCR was calculated by dividing urea by creatinine, and multiplying by 1,000 (abnormal ≥100). Statistics were analysed using SPSS.

Results and discussion

Three-hundred and fifty-seven patient records were reviewed (median age, 68); 179 had a plausible AUGIB (50.1%). Receiver operator characteristic (ROC) curves for urea gave an area under the curve (AUC) of 0.733. For URCR, AUC was 0.789 (Fig 1).
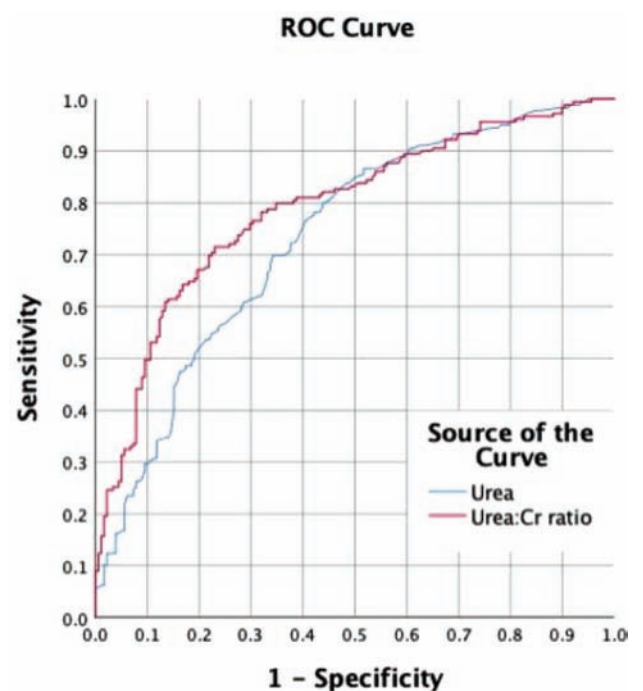
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Fig 1. ROC curve

Binary logistic regression modelling was performed using age, urea and URCR. χ^2 (3, n=357) = 102.92, p<0.001. 25–34% of the variance in AUGIB is explained by the model.

The model URCR value of 97.7 can be used to predict AUGIB, applying this to our data set correctly identifies 124/179 patients with AUGIB (69.3%), and is predicted to correctly identify 74.5%.

Conclusion

This pilot study has limitations as bleeding lesions may have not been identified at OGD. Urea and URCR have AUCs of 0.733 and 0.789. Logistic regression modelling suggests a URCR level of 100 would correctly identify ~70% of AUGIB in patients with suggestive symptoms. Outside of firm indications for OGD in suspected AUGIB (shock, previous/suspected variceal bleed), a raised URCR appears to be a useful marker to predict AUGIB: a larger study would be able to test this robustly. ∎

Conflict of interest statement

None declared.

Reference

1   Srygley FD, Gerardo CI, Tran T, Fisher DA. Does this patient have a severe upper gastrointestinal bleed? *JAMA* 2012;307:1072–9.