Letter to the Editor: "Urinary TIMP-2 and IGFBP-7 protein levels as early predictors of acute kidney injury after cardiac surgery".

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Letter:

To the Editor,

The journal's article "Urinary TIMP-2 and IGFBP-7 protein levels as early predictors of acute kidney injury after cardiac surgery" piqued our attention. [1] It highlights the early identification of AKI after cardiac surgery based on a spike in urinary TIMP-2 and IGFBP-7 protein levels and links this with urinary dilution measurements. We agree that [TIMP2] [IGFBP7] can help determine postoperative AKI risk. We believe a few ideas could improve the overall quality based on our expertise in reviewing your paper.

Firstly, IGFBP-7 has a specificity of 90.7% and a sensitivity of 32.4% in detecting early-stage oesophagal small cell carcinoma, excluding patients with this disease from preoperative evaluation.[4] This shows that patients with ESCC may provide misleadingly favourable AKI results following cardiac surgery. Acute aggravation of Chronic Obstructive Pulmonary Disease is also associated with an increase in IGFBP-7 levels; 14% of patients who developed AKI after cardiac surgery have a history of COPD. Their increase in IGFBP-7 may have been caused by Acute exacerbation of COPD or pulmonary problems resulting from anaesthesia.[2]While

identifying novel biomarkers for predicting AKI onset has been a significant emphasis in recent years, less attention has been dedicated to searching for valuable biomarkers predictive of AKI outcome, including renal recovery and the requirement for renal replacement therapy, and patient death.3 IGFBP7 and neutrophil gelatinase-associated lipocalin (NGAL) were found as the most significant predictors of renal recovery in a small cohort of critically sick adult patients using a proteomic method; subsequent validation validated the prognostic utility of IGFBP7 and NGAL in predicting death. The authors mentioned that 28% of patients developed AKI after cardiac surgery associated with a rise in urinary TIMP-2 and IGFBP-7 levels but did not mention KIM-1, a type I transmembrane glycoprotein with two extracellular domains that separate from the cell surface and enter the urine. KIM-1 expression is negligible in normal kidneys but rapidly increases in AKI patients after heart surgery. Urine KIM-1 is a simple, noninvasive, and specific biomarker for AKI.[3] The authors focused on intra- and postoperative urine samples. AKI could also be anticipated preoperatively before cardiac surgery by urine spermidine, a polyamine with known antioxidant capabilities, which demonstrated the highest ability to identify high-risk patients.[3]

The correlation between urinary albumin increases (up to 100-fold) and TIMP2 and IGFBP7 excretion supports the hypothesis of enhanced glomerular permeability to all three proteins followed by decreased endocytic absorption by injured proximal tubules. These results show urinary albumin assay should supplement clinical TIMP2/IGFBP7 evaluations. Exclusion criteria should include nephrotoxic medication screening (ibuprofen, vancomycin, angiotensin-converting enzyme inhibitors, gentamycin, etc.).4 Preoperative screening for tumour markers like IGFBP-7 can prevent false-positive ESCC and colorectal cancer outcomes. Even in preoperative samples, urinary markers like spermidine show promise in screening high-risk outpatients for AKI. Blacks tend to have AKI-related surgery. Hence blacks and whites should be evaluated independently.[5]

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