Internal Medicine
The Japanese Society of Internal Medicine
doi: 10.2169/internalmedicine.3308-23
Intern Med 63: 2719, 2024
http://internmed.jp

【 LETTERS TO THE EDITOR 】

Applicable Machine Learning Model for Predicting Contrast-induced Nephropathy Based on Pre-catheterization Variables

Key words: acute kidney injury, contrast-induced nephropathy, percutaneous coronary intervention, machine learning

(Intern Med 63: 2719, 2024)
(DOI: 10.2169/internalmedicine.3308-23)

The Authors Reply We thank Kataoka et al. for their interest in our recent study on developing a contrast-induced nephropathy (CIN) prediction model with machine learning and for their helpful comments. The model included seven pre-intervention variables that were found to be the most significant. As Kataoka et al. mentioned, urine parameters, such as liver-type fatty acid-binding protein, may indeed be helpful in predicting the risk of CIN. However, these parameters are not routinely checked, and many hospitals do not have the ability to estimate the levels of liver-type fatty acid-binding proteins (1). Therefore, we included variables that were routinely and widely assessed. Kataoka et al. wondered if volume expansion, a well-known and frequently used strategy for CIN prevention, was considered in this study. This was not considered because the purpose of this study was to predict the risk of CIN based on patient condition (2). Furthermore, the specific method and indication for hydration to prevent CIN may vary among hospitals.

Kataoka et al. pointed out that the upper limit of N-terminal pro-B-type natriuretic peptide (NT-proBNP) is set low on our website. However, the NT-proBNP value was included in the model, not as an absolute value but to determine whether it was higher than normal, within the normal range, or lower than normal. Therefore, the upper limit of the NT-proBNP level did not influence the results. Although age is not a correctable variable, it can help predict the risk of CIN.

As the letter by Kataoka et al. mentioned, in urgent cases, the prodecure should be performed regardless of the risk of CIN. However, this does not diminish the significance of predicting risk altogether, as the postprocedural course for patients with an increased risk of CIN may vary. This allows for further consideration of the use of other nephrotoxic agents and helps determine the inpatient duration to observe a stable trend in the renal function. Therefore, it is important to conduct risk prediction even for emergency procedures.

The authors state that they have no Conflict of Interest (COI).

Heejung Choi [1], Byungjin Choi [2] and Inwhee Park [1]

References

1. Nakamura T, Sugaya T, Node K, Ueda Y, Koide H. Urinary excretion of liver-type fatty acid-binding protein in contrast medium-induced nephropathy. Am J Kidney Dis **47**: 439-444, 2006.
2. van der Molen AJ, Reimer P, Dekkers IA, et al. Post-contrast acute kidney injury. part 2: risk stratification, role of hydration and other prophylactic measures, patients taking metformin and chronic dialysis patients: recommendations for updated ESUR Contrast Medium Safety Committee guidelines. Eur Radiol **28**: 2856-2869, 2018.

[1]Department of Nephrology, Ajou University School of Medicine, Korea and [2]Department of Biomedical Informatics, Ajou University School of Medicine, Korea
Received: December 4, 2023; Accepted: December 5, 2023; Advance Publication by J-STAGE: February 1, 2024
Correspondence to Dr. Inwhee Park, inwhee@aumc.ac.kr
