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Validation and Assessment of Kidney failure risk equations in Korean population

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Objectives: Predicting the risk of chronic kidney disease (CKD) may facilitate early and appropriate nephrology care of CKD patients. Previously, kidney failure risk equations were developed in Canadian population and validated in more than 30 countries spanning 4 continents. However, there is no validation data in Korean population. Thus, we attempted to evaluate the accuracy of the risk equations in Korean population and to adjust the equation.

Methods: SNU cohort, including 1386 patients with CKD in Seoul National University Hospital (SNUH) and Seoul National University Boramae Medical Center (SNUBMC), were studied. These cohorts collected data from 2001 through 2016. With the risk factors from the original risk equations, hazard ratios were estimated in SNU cohort and used to adjust the equation. The time horizon for risk prediction was 5 years. We used three risk prediction equations, 4-variable, 6-variable and 8-variable equations. Then, these three equations were evaluated using AUROC for the goodness of a predictor, integrated discrimination improvement (IDI) for discrimination, and net reclassification improvement (NRI) at 5 years.

Results: The mean age of the study population was 58 years, and the mean baseline eGFR was 73 mL/min/1.73m². The three risk prediction equations showed great performance of prediction (AUROC, 0.91; 95% CI, 0.88-0.94 at 4-variable equation, 0.91; 95% CI, 0.88-0.94 at 6-variable equation, 0.91; 95% CI, 0.89-0.94 at 8-variable equation). Using DeLong test, 4-variable equation and 6-variable equation were compared with at 8-variable equation. There was no improvement in performance with 8-variable equation (4-variable equation vs 8-variable equation, p=0.068 and 6-variable equation vs 8-variable equation, p=0.080).

Conclusions: Adjusted Kidney failure risk equation showed high performance of prediction in Korean population. However, further verification in a larger cohort may be necessary in the future.