KSN 2022
SEOUL, KOREA MAY 26 - 29

Abstract Submission No. : 1331

Deep learning-based prediction model for prognosis of IgA nephropathy

Sehoon Park[1], Yisak Kim[2], Young-Gon Kim[2], Kyung Chul Moon[3], Hajeong Lee[1]
[1]Department of Internal Medicine-Nephrology, Seoul National University Hospital, Korea, Republic of
[2]Department of Transdisciplinary Department of Medicine and Advanced Technology, Seoul National University Hospital, Korea, Republic of
[3]Department of Pathology, Seoul National University Hospital, Korea, Republic of

Objectives: A further deep learning-based prediction model for the prognosis of IgA nephropathy is warranted.

Methods: We included following numbers of IgA nephropathy patients from three tertiary hospitals in Korea: Seoul National University (N=2040), Seoul National University Bundang hospital (N=676), and Chungbuk University Hospital (N=154). We used the "SAINT" to construct the prediction model for prognosis of IgA nephropathy. The study outcome included eGFR decline for 50% from baseline and progression to end-stage kidney disease. The developmental cohort included randomly sampled 80% cases from Seoul National University Hospital and an internal validation cohort included 20% cases, respectively. The cohorts from the other two hospitals were implemented as the external validation data. Total of 108 variables including various demographic histories, past-medical information, pathologic parameters, medication histories, and laboratory values were included in the prediction model.

Results: The 10-year outcome occurrence rates were 22.5%, 17.8%, and 12.3% in the three hospitals, respectively. The constructed deep-learning based model from the developmental data showed acceptable performance in the internal validation test (1, 3, 5 and 10-year AUC: 0.957, 0.941, 0.921, and 0.918). The model showed similar results in the Seoul National University Bundang Hospital data (1, 3, 5, and 10-year AUC: 0.917, 0.903, 0.884, and 0.828) and in the Chungbuk University Hospital data (1, 3, and 5-year AUC: 0.910, 0.901, and 0.864).

Conclusions: This study constructed an externally-validated prediction model for prognosis of IgA nephropathy using a deep-learning method. The model may be introduced to clinical practice as the model showed acceptable performance in the three independent cohorts.