THE KOREAN SOCIETY OF NEPHROLOGY
APCN & KSN 2024
June 13(Thu) - 16(Sun), 2024 Coex, Seoul, Korea
Promoting Sustainable Kidney Health: The Asia-Pacific and Beyond

Abstract Submission No.: A-0375

External Validation of an Updated International IgA Nephropathy Risk Prediction Tool in Chinese Population

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Objectives : The International IgA Nephropathy Network Collaborative 2022 updated the International IgA Nephropathy Risk Prediction Tool (IIGAN-PT)，so that it can be used for risk stratification one to two years after biopsy. The prediction tool contains both race and without race models. However, the updated IIGAN-PT has not been externally validated from populations in other regions, except for external validation by the development team. This study aimed to externally validate the updated International IgA Nephropathy Prediction Tool using a modern Chinese cohort to assess the predictive performance of the tool.
Methods : We included 248 patients with biopsy-confirmed primary IgA nephropathy from the Second Hospital of Jilin University from January 2013 to December 2021 and calculated predicted risks for each patient. The outcomes of interest were 50% decline in eGFR or kidney failure. We assessed the performance of the updated IIGAN-PT using discrimination, calibration, reclassification, and clinical utility.
Results : The median follow-up was 48 months, and the updated prediction tool had better predictive performance than the original prediction tool. Both updated models demonstrated excellent discrimination (concordance statistics 0.85, 0.84). Survival curves for subgroups (<16%, 16%-50%, 50%-84%, and ≥84% of linear predictors) were well separated. Both updated models showed acceptable calibration. The updated race model showed a slight improvement over the original race model in predicting 4-year risk reclassification, with net reclassification improvement（NRI）of 0.30 (95% CI, 0.04-0.53) and integrated discrimination improvement (IDI) of 0.05 (95% CI, -0.01-0.12), and the updated without race model showed no significant difference over the original model, with NRI of 0.11 (95% CI, - 0.14-0.40) and IDI of 0.02 (95% CI, -0.04-0.08). Decision curve analysis showed that both updated models were clinically useful and not significantly different in predicting 4-year risk.
Conclusions : The updated IIGAN-PT demonstrated significant discrimination, acceptable calibration, and satisfactory clinical utility.

Figure1.png

Item	Prediction Tool model with race/ethnicity		Prediction Tool model without race/ethnicity	
	Original model	Post-biopsy model	Original model	Post-biopsy model
C-statistic	0.82 (0.75-0.89)	0.85 (0.79-0.91)	0.83 (0.77-0.89)	0.84 (0.78-0.90)
ΔC-statistic	Ref	0.03	Ref	0.01
AUC at 4-year	0.82	0.85	0.84	0.85
ΔAUC at 4-year	Ref	0.03	Ref	0.01
NRI	Ref	0.30 (0.04-0.53)	Ref	0.11 (-0.14-0.40)
IDI	Ref	0.05 (-0.01-0.12)	Ref	0.02 (-0.04-0.08)

Δc-statistic, change in C-statistic; ΔAUC at 4-year, change in AUC at 4-year;
IDI, integrated discrimination improvement; NRI, net reclassification improvement;
Ref, reference model for comparison;