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Non-invasive Prediction Tool Of Non-diabetic Kidney Diseases In Patients With Type-2 Diabetes Mellitus Derivation and Validation

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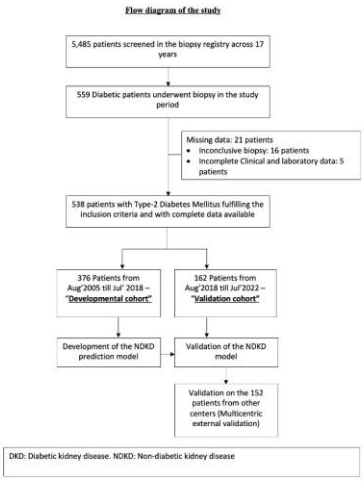
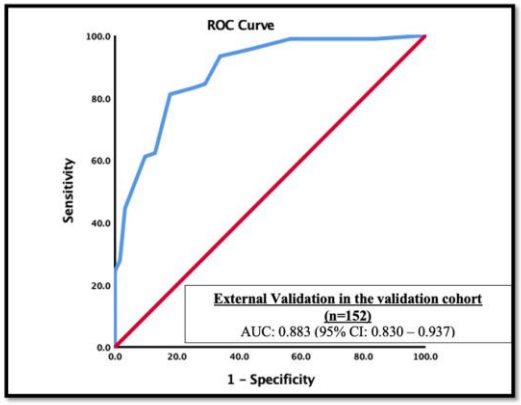
Objectives : Despite being the gold standard in detecting non-diabetic kidney diseases (NDKD) in Type-2 Diabetes Mellitus, renal biopsy has an inherent risk of life-threatening complications. The current study is aimed to develop and validate a non-invasive scoring tool to predict NDKD using clinical and laboratory variables.
Methods : We developed a model to detect NDKD using multivariable binary logistic regression analysis with the backward Wald elimination method. We included all patients of T2DM who had an indication kidney biopsy for NDKD during the study period. The model was assessed using the AUC-ROC curve on both the derivational (internal validation) and validation cohort (temporal validation), as well as external cohorts from other centers (multicentric external validation).
Results : Out of 538 patients, 376 were included in the derivational, and 162 in the validation cohort. Besides, 152 patients from two other centers who fulfilled the inclusion criteria were taken for multicentric external validation. The model consists of the following variables, T2DM duration< 5 years (p=0.003), absence of coronary artery disease (p=0.05), absence of diabetic retinopathy (p=0.001), presence of oliguria (p=0.02), acute rise in serum creatinine (p< 0.001) and low serum complement-C3 level (p=0.001) significantly predicted NDKD on renal biopsy. Both derivation and validation cohorts showed the best prediction at a score of 6. The model performed robustly with an AUC-ROC of 0.869 (95%CI:0.805-0.933) in the validation cohort and 0.883 (95%CI:0.830–0.937) on multicentric external validation.
Conclusions : The clinical and laboratory parameter-based non-invasive prediction model robustly predicted the NDKD among T2DM patients with renal dysfunction, and a total cut-off score of ≥ 6 has a high sensitivity of 86% and an equally good specificity of 80% in predicting NDKD. Given the good accuracy of the pre-test probability in predicting the NDKD, the scoring model has the potential to reduce the burden of unwanted biopsies.

Figure.1.Consort_NDKD.jpg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