

Prediction models for diabetes classification can identify patients treated as having Type 2 diabetes who progress to insulin therapy within 3 years



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Background

Diagnosing Type 1 diabetes in adults is difficult

Majority of Type 1 patients require insulin within 3 years of diagnosis

Previously developed Type 1 Diabetes prediction models are untested in a prospective study

Objectives

Investigate if *diabetes classification models* can *identify patients who progress to insulin treatment* within 3 years

Methods

957 non-insulin treated, aged 18-88, recently diagnosed diabetes patients from **StartRight**.

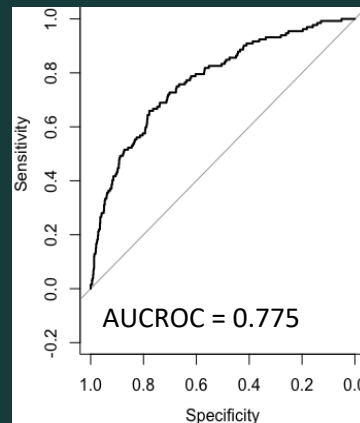
2.5 years duration of diabetes by study end

3 previously developed models were applied:

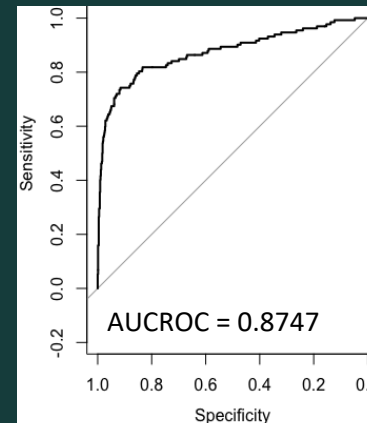
1. Clinical Features (BMI + Age at Diagnosis)
2. Clin F + GAD + IA2
3. Clin F + GAD + IA2 + Type 1 Diabetes Genetic Risk Score

Results

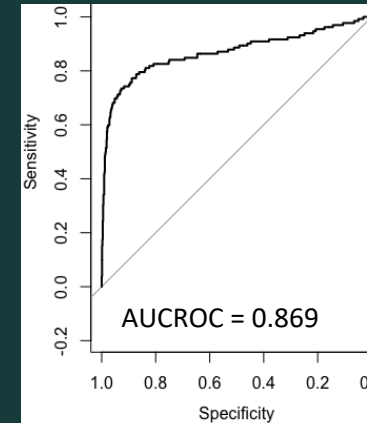
1. Model 1 ROC Curve



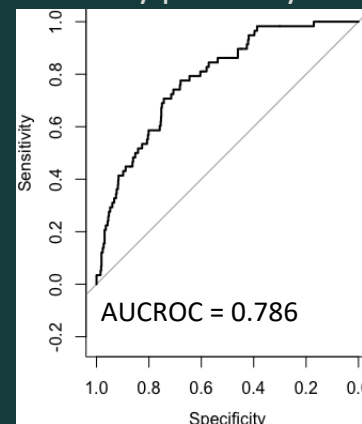
2. Model 2 ROC Curve



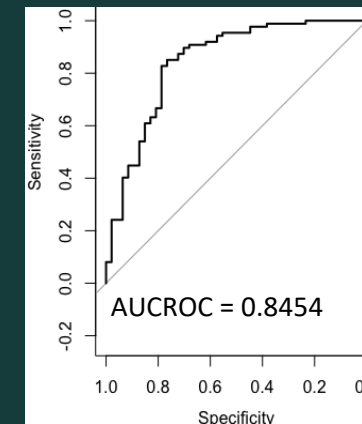
3. Model 3 ROC Curve



4. Model 1 ROC for multi antibody positivity



5. Model 2 ROC for insulin progression in antibody positive



- All 3 models showed significant discrimination for insulin progression
- Adding Antibodies (GAD + IA2) [Model 2] significantly improved discrimination, but adding T1DGRS [Model 3] did not further improve discrimination
- Model 2 and model 3 were found to have better discrimination than using antibodies alone (AUCROC = 0.8084).
- Model 1 showed additional discrimination for multi-antibody positivity (AUCROC = 0.786) [Graph 4]
- Model 2 showed additional discrimination for insulin progression in those who were *antibody positive* (AUCROC = 0.8454) (Graph 5)

Conclusion

All models are able to discriminate for insulin progression at diagnosis

Clinical Application:

- Model 1 can be used as a screening tool to detect high risk antibody/insulin progression patients
- Model 2 can discriminate in antibody positive group for insulin progression