Using Machine-Learning to Predict Most Likely Type 2 Diabetes Complications

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• No previous work modeled related complications
• Type 2 Diabetes Mellitus (T2DM) is metabolic disorder

BACKGROUND

Data source: OptumLabs
• Use resulting predictive models to identify differential progression markers that predict progression of individual patient to most likely complications

METHODS

• Includes de-identified administrative claims data on commercially insured and Medicare Advantage enrollees
• Our work will potentially help clinicians – make an accurate prognosis – prioritize treatment targets – develop optimal individualized treatment strategies

METHODS (CONTINUED)

• Data: socio-demographics, lab results, vital signs, smoking status, diagnoses

RESULTS

Display of differential markers using spider plots
• For any variable, distance away from center indicates increased risk

RESULTS (CONTINUED)

Predictive performance: Concordance
• For any two patients, probability that one who progressed to complication earlier has higher predictive risk

CONCLUSIONS

• Methodology applied Multi-Task Learning in reverse; successfully identified differential markers that predict progression of individual patient to most likely complications
• Some of differential markers were consistent with existing literature; others were novel and need further validation
• Resulting predictive models achieved high predictive power
• Our work will potentially help clinicians – make an accurate prognosis – prioritize treatment targets – develop optimal individualized treatment strategies

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