Investigating the Association Between Type 2 Diabetes and Parkinson's Disease Using Electronic Medical Records in the GoDARTS Bioresource

Abstract—
Pre-clinical and clinical data have linked type 2 diabetes (T2D) and Parkinson's disease (PD), suggesting pathological mechanisms associated with insulin resistance may influence the development and progression of PD. This retrospective case-control study utilized the GoDARTS bioresource to

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investigate the impact of T2D on PD incidence. GoDARTS represents a large case-control study of T2D with longitudinal follow up in electronic medical records (EMR). PD cases were passively identified in the EMR.

T2D status was associated with a significant risk of PD (cause-specific hazard ratio [csHR]=1.40; 95%CI=1.14-1.73). However, this association was weakened when accounting for competing risk of death (subdistribution [sd]HR=1.18; 95%CI=0.96-1.45).

Clinical features common to T2D patients, other than insulin resistance, may influence PD development. As cardiovascular disease (CVD) is the leading cause of death in T2D patients, the influence of CVD risk factors was investigated within this cohort. Subjects who developed PD were significantly older, of higher SIMD5 index, lower BMI, and had lower diastolic blood pressure, total cholesterol and triglyceride levels. No significant difference was seen with systolic blood pressure, alcohol status, physical activity, or CVD polygenic risk score. Smoking was a protective factor.

This study indicates T2D is associated with increased risk of PD. The lack of association of CVD risk factors amongst T2D patients suggests the link between T2D and PD may be explained by insulin resistance. T2D and PD remain incurable, and continue to increase in incidence. However, further investigating their association may enable implementation of preventative lifestyle and clinical interventions.

Keywords—
Cardiovascular disease risk, Electronic Medical Records, GoDARTS, Insulin Resistance, Neurodegeneration, Parkinson's Disease, Type 2 Diabetes