THE ASSOCIATION OF DIABETES AND CEREBRAL BLOOD FLOW IN COMMUNITY DWELLING OLDER ADULTS

Paul Claffey1,2, Robert Briggs1,3, Triona McNicholas1,3, Rose Anne Kenny1,2,3
1Mercer’s Institute for Successful Ageing, St. James’s Hospital, Dublin, Ireland
2Dept. Medical Gerontology, Trinity College Dublin, Dublin, Ireland
3The Irish Longitudinal Study on Ageing, Trinity College Dublin, Dublin, Ireland

Background: Diabetes is a significant risk factor for both depression and dementia in later life. The aim of this study was to assess whether diabetes is associated with lower cerebral perfusion, specifically frontal lobe perfusion, which has been implicated in late life depression and vascular dementia among a large cohort of community dwelling older people.

Methods: This study was embedded within TILDA (The Irish Longitudinal Study on Ageing). Over 2,500 participants aged ≥50 years were included and underwent measurement of blood pressure (BP) by finometry and frontal lobe perfusion by near-infrared spectroscopy (NIRS) both at baseline and during orthostasis. Real-time frontal lobe cerebral oxygenation was measured by the Portalite System, detecting changes in frontal lobe perfusion and reporting a % Tissue Saturation Index (TSI). Diagnosis of diabetes was based on self-report or Haemoglobin A1c levels consistent with a diagnosis of diabetes.

Results: Over 6% (169/2,626) of the study sample had diabetes. Mean TSI was significantly lower in those with diabetes at both baseline (70.0 +/- 4.8% vs. 71.0 +/- 4.7%; p = 0.0142; t = 2.45) and 30 seconds after standing (69.4 +/- 4.8% vs. 70.6 +/- 4.8%; p = 0.0018; t = 3.12). Linear regression models demonstrated that diabetes was strongly associated with lower TSI at baseline (beta-coefficient = -0.82 (95% CI: -1.58 to -0.07) and at 30 seconds post standing (beta-coefficient = -1.12 (95% CI: -1.88 to -0.36) after controlling for covariates such as systolic blood pressure, orthostatic hypotension, stroke and cognitive impairment.

Conclusion: Diabetes is associated with lower frontal lobe cerebral perfusion in a large cohort of community-dwelling older people, independent of cardiac and haemodynamic risk factors. This association may explain the significant link between diabetes and poor brain health outcomes in later life.