Cognitive Impairment in Type 2 Diabetes Mellitus: An Observational Study from Lower Middle-Income Country

Sir,

Diabetes mellitus is a major cause of morbidity and mortality all around the globe with approximately 463 million adults living with it worldwide.[1] A link between type 2 diabetes mellitus (T2DM) and mild cognitive impairment (CI), vascular dementia and Alzheimer's disease has been observed in studies.[2,3] Timely and early identification of those who have mild CI will help recognize individuals who have a chance to progress further to CI.[4]

Various tools are available to screen CI. The Ascertain Dementia 8-Item Informant Questionnaire (AD8) is one easy informant-based screening method.[5]

Pakistan is majorly affected by diabetes with a prevalence of around 7.89%.[6] Local data studying the effect of diabetes on CI are limited. This study was designed to determine the prevalence of CI in T2DM patients presenting in the clinics of a tertiary care hospital.

This cross-sectional study was conducted at the Medicine Clinics of Aga Khan University Hospital, Karachi, Pakistan, from January to June 2019 after taking the ethical approval from the institutional ethical review committee. All patients of diabetes mellitus for at least 1 year within the age range of 45–75 years were included in the study after taking informed consent. Sensory and motor examination was carried out for all patients in clinic; those having any abnormality in the said examination were excluded from the study. All patients following a psychiatrist previously or with electrolyte imbalances in the past 3 months (serum Na <130 mEq/l or >150 mEq/l and serum corrected Ca <8 mg/dl or >11 mg/dl) were excluded from the study.

CI was assessed by AD8 score; the patient was classed as having no CI if they have an AD8 score of 0–2 and they were classed as having CI if they have an AD8 score of more than 2.

A total of 200 patients were enrolled in this study. The mean age of participants was 56.06 ± 6.8 years and 116 (58%) were female. Mean body mass index was 29.48 ± 5.05 per meter square while mean fasting blood glucose and glycosylated haemoglobin were 150.24 ± 19.93 mg/dl and 8.75 ± 0.86, respectively. Mean duration of type 2 diabetes was 8.19 ± 6.05 years with 91 (45.5%) participants having diabetes for more than 6 years.

Mean AD8 score was 1.63 ± 1.57. CI was seen in 33 (16.5%) patients with T2DM. Of patients <55 years of age, CI was seen in 7 (6.9%) patients compared to 26 (26.3%) among patients of age ≥55 years ($P < 0.001$). Gender difference was also significant in CI patients, 7 (8.3%) males compared to 26 (22.4%) females (P 0.006). Frequency of CI in patients with T2DM working in offices was 8 (26.7%) compared to 3 (8.1%) cases among self-employed patients (P 0.023). Among patients with less than six years of diabetes, CI was seen in 10 (9.2%) patients compared to 23 (25.3%) among patients with duration of diabetes of more than 6 years (P 0.002). Regarding treatment of diabetes, among patients taking oral hypoglycaemics, CI was seen in 7 (7.4%) cases compared to 26 (24.5%) among patients using insulin (P 0.001). Lastly, patients living in rural areas had a higher frequency of CI; 22 (29.3%) cases compared to 11 (8.8%) among patients living in urban areas ($P < 0.001$).

This is one of the first study to explore a new scale to measure cognitive decline in T2DM patients. Increasing age, female gender, low level of education, long-standing diabetes, patients on insulin and residents of rural area were all found to be significantly associated with CI. Screening the diabetic population for CI at the level of internal medicine is very important so that they can be referred promptly and accurately to a neuro-psychiatrist for further treatment without major delays. Early identification of CI will help to improve the quality of life and to reduce the complications and expenditures.

There are some major limitations to our study. The findings of this study should be interpreted cautiously as the sample is not representative of the population and we could not assess all potential metabolic confounders which is another shortcoming.

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Conflicts of interest

There are no conflicts of interest.

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