

Cardiovascular health metrics defined by Life's Essential 8 scores predicts macrovascular and microvascular complications in type 2 diabetes

Aims: To investigate the association between the Life's Essential 8 (LE8) score, a multifactorial cardiovascular health assessment tool, and the risk of vascular complications in individuals with type 2 diabetes (T2DM).

Methods: This prospective cohort study analysed data from the UK Biobank, a large population-based study of over 500,000 participants (40-69 years at recruitment from 2006-2010). The analysis included 11,033 participants with T2DM with no macrovascular disease and microvascular complications at baseline. Participants were followed for a median of 12.1 years to assess the incidence of new macrovascular (e.g., coronary heart disease, stroke) and microvascular (e.g., diabetic retinopathy, neuropathy) complications, identified using hospital inpatients admission data. A modified LE8 score, containing factors like smoking status, BMI, physical activity, non-HDL cholesterol, blood pressure, HbA1c, dietary habits reflecting UK patterns, and sleep duration, was used at baseline. Participants were divided into four quartiles based on their LE8 score. Additionally, a dose-response relationship between the overall LE8 score and complication risk was measured.

Results: Compared to the lowest quartile, participants in higher LE8 quartiles were more likely female, with higher education and income, longer sleep duration, increased physical activity, better dietary habits, lower BMI, blood pressure, non-HDL cholesterol, HbA1c, and socioeconomic deprivation score (TDI). They also had a lower prevalence of White ethnicity, frequent alcohol consumption, and current smoking. A strong inverse association was observed between baseline LE8 score and both macrovascular and microvascular complications at follow up. The highest quartile (Q4) displayed a halved risk of macrovascular disease compared to the lowest (12.8% vs. 22.2%). Similarly, participants in higher LE8 quartiles (Q2, Q3, and Q4) had significantly lower risks of macrovascular diseases with hazard ratios ranging from 0.55 to 0.81. Every 10-point increase in LE8 score was associated with an 18% lower risk of developing macrovascular disease. Likewise, the risk of microvascular complications decreased with higher LE8 score quartiles. The highest quartile experienced a halved risk compared to the lowest (13.1% vs. 19.6%). Every 10-point increase in LE8 score was associated with a 15% lower risk of developing microvascular complications. Importantly, the association between higher LE8 scores and lower risk of complications remained consistent across subgroups based on age, sex, ethnicity, education, socioeconomic status, and medication use.

Conclusions: This study shows a strong link between a higher LE8 score and a lower risk of both macrovascular and microvascular complications regardless of various demographic and clinical factors.

Comments. This study highlights the link between healthy lifestyles and reduced vascular complications in T2DM. Notably, the LE8 score's protective effect was strongest for peripheral artery disease and nephropathy. The protective effect of LE8 on macrovascular diseases was stronger in individuals with higher education, suggesting education may influence healthy lifestyle results in lower cardiovascular risk. Analysing individual LE8 components revealed never smoking and glycaemic control as the most impactful factors for reducing macrovascular and microvascular complications, respectively. The limitation of this study is the baseline assessment of LE8 score, overlooking potential lifestyle changes over time. This study highlights the potential of using the LE8 score to identify high-risk patients and the benefits of adopting healthy behaviours to reduce vascular complications.

Maryam Ferdousi

Reference. Huang ZG, Gao JW, Zhang HF, You S, Xiong ZC, Wu YB, Guo DC, Wang JF, Chen YX, Zhang SL, Liu PM. Cardiovascular health metrics defined by Life's Essential 8 scores and subsequent macrovascular and microvascular complications in individuals with type 2 diabetes: A prospective cohort study. *Diabetes Obes Metab.* 2024 Apr 1. doi: 10.1111/dom.15583. Epub ahead of print. PMID: 38558498.

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