

Association between Glycated Hemoglobin/High-Density Lipoprotein Cholesterol Ratio and Cognitive Impairment in Elderly Heart Failure Patients

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Objective: With the population aging, the prevalence of heart failure (HF) in elderly patients was increasing. Cognitive impairment, a common complication of elderly HF patients, severely affects quality of life, treatment adherence, and prognosis. Glycated hemoglobin (HbA1c) and high-density lipoprotein cholesterol (HDL-C) are closely associated with vascular cognitive impairment. The HbA1c/HDL-C as a composite indicator integrating metabolic and lipid disorders, can more comprehensively reflect systemic metabolic imbalance. However, the relationship between HbA1c/HDL-C and cognitive impairment in elderly HF patients remains scarce. This study aimed to investigate the association between HbA1c/HDL-C and cognitive impairment in elderly HF patients.

Methods: This retrospective cohort study enrolled 210 elderly HF patients admitted between January 1, 2023, and June 30, 2023. HbA1c and HDL-C were collected, and patients were stratified into three groups (T1, T2, T3) according to tertiles of HbA1c/HDL-C. Follow-up was completed by December 20, 2025. The endpoint was cognitive impairment, which was assessed using the Montreal Cognitive Assessment scale.

Results: During a median follow-up of 27.3 months, the incidence of cognitive impairment was significantly higher in the T3 group compared with the T1 and T2 groups ($P < 0.05$). The area under the receiver operating characteristic curve of the HbA1c/HDL-C for cognitive impairment was 0.608 (95%CI: 0.531–0.719). Multivariable Cox regression showed that each 1-standard deviation increase in HbA1c/HDL-C was associated with a 123.8% higher risk of cognitive impairment (HR=2.238; 95%CI:1.547–3.467). When using the T1 group as the reference, the HR for cognitive impairment in the T3 group was 3.985 (95% CI:1.944–6.253).

Conclusion: Elevated HbA1c/HDL-C was independently associated with a higher risk of cognitive impairment in elderly HF patients.

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