

Association Between hs-CRP/HDL-C Ratio and Stroke Risk in Middle-Aged and Older Chinese Adults: A Propensity Score-Matched Analysis

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Abstract

Background: Stroke remains a leading cause of mortality and disability in China, particularly among the aging population. Simple and cost-effective screening tools are urgently needed to identify high-risk individuals. The hs-CRP to HDL-C ratio (CHR), a composite index reflecting both inflammation and lipid metabolism, may serve as a potential predictor of stroke risk. **Objective:** This study aimed to investigate the association between CHR and incident stroke among middle-aged and older adults in China using propensity score matching (PSM) and multivariate analysis. **Methods:** Data were obtained from the 2015 wave of the China Health and Retirement Longitudinal Study (CHARLS). After excluding participants with prior stroke or missing data, 10,563 individuals were included. The CHR was calculated using the formula $[\text{hs-CRP (mg/L)} / \text{HDL-C (mg/dL/1000)}] \times 100$. PSM was performed using variables with $P < 0.001$ in univariate analysis (caliper = 0.02, 1:1 matching), resulting in 344 matched pairs. Logistic regression was used to explore risk factors, and restricted cubic spline (RCS) analysis was applied to assess dose-response relationships. ROC curves were constructed to evaluate predictive performance before and after matching. **Results:** A total of 406 new stroke events (3.8%) were identified before matching. CHR was significantly associated with incident stroke, with RCS indicating a linear relationship. The optimal CHR cutoff was 13.62. The area under the ROC curve (AUC) improved from 0.584 before matching to 0.955 after PSM, with increased sensitivity and specificity. **Conclusion:** The CHR is independently associated with incident stroke among middle-aged and older Chinese adults. After adjustment for confounders, CHR demonstrated high predictive value. As a readily accessible and economical biomarker, CHR has potential for early screening and prevention of stroke in aging populations.

Keywords

High Sensitive C-reactive Protein, High-density Lipoprotein Cholesterol, Stroke, CHARLS