

Integrative Chinese and Western Medicine Perspective on Cardiovascular Risk Prediction: Integration of TCM Macro-Phenotypes with Western Medical Indicators

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Abstract

Early risk assessment for cardiovascular disease is a key step in preventing cardiovascular events and reducing disease burden. However, existing assessment tools still face the issue of residual risk, as traditional models struggle to cover all risk dimensions. This paper systematically explores the integrative pathways and innovative applications of artificial intelligence in cardiovascular risk assessment from the perspective of integrating Chinese and Western medicine. Based on a review of mainstream technologies and research advances, it identifies limitations in current models, such as data source bias, insufficient interpretability, and single-dimensional risk evaluation. It further demonstrates the value of incorporating TCM macro-phenotypes, such as syndromes and body constitution, into cardiovascular risk assessment, and summarizes research progress in the digitization and objectification of the four diagnostic methods. The study suggests that methods such as association rule mining can significantly improve the integration efficiency, discovery of implicit relationships, and risk prediction performance between Western micro-level indicators and TCM macro-phenotypes, thereby effectively supporting clinical decision-making and enabling personalized risk assessment and early warning. Future efforts should focus on deepening multimodal data integration, advancing the development of high-quality databases that combine Chinese and Western medicine, and optimizing association rule mining methods. These steps will facilitate the standardization and personalization of cardiovascular risk assessment, promote the integration of Chinese and Western medicine, and provide important theoretical guidance and practical reference for empowering the "preventive treatment of disease" approach in cardiovascular care with AI.

Keywords

Artificial Intelligence, Cardiovascular Disease, Risk Assessment, Integration of Chinese and Western Medicine, Association Rule Mining, Preventive Treatment of Disease