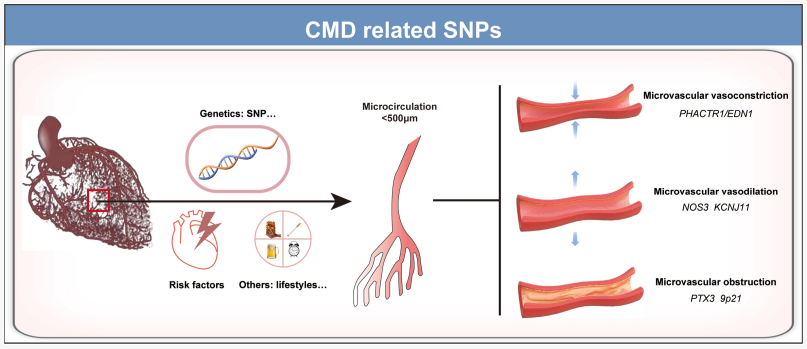
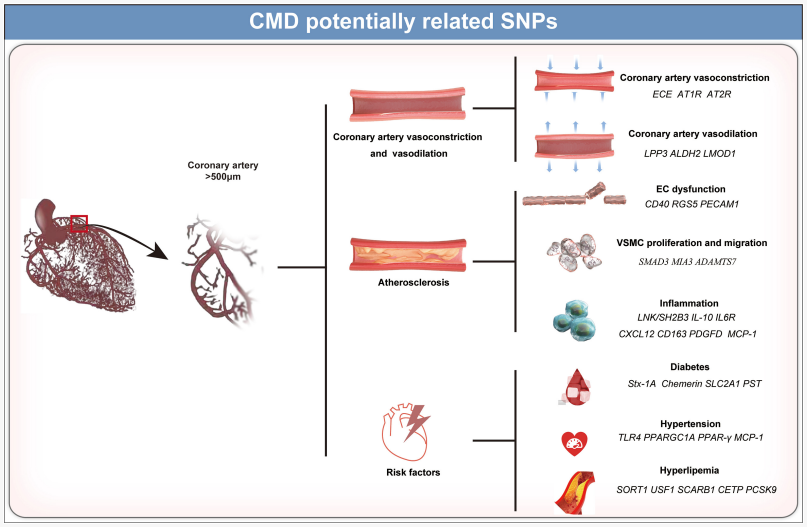
The Role of Single Nucleotide Polymorphisms in Coronary Microvascular Dysfunction

SHANNON, CLARE, IRELAND, February 25, 2025 /EINPresswire.com/ -- A new review highlights the potential role of single nucleotide polymorphisms (SNPs) in improving the early diagnosis and targeted intervention of coronary microvascular dysfunction (CMD)—a condition linked to myocardial ischemia despite the absence of major artery blockages.



CMD-related SNPs. CMD, coronary microvascular dysfunction; SNP, single nucleotide polymorphism.



Prediction of CMD-related SNPs. CMD, coronary microvascular dysfunction; EC, endothelial cell; SNP, single nucleotide polymorphism; VSMC, vascular smooth muscle cell.

CMD affects a significant proportion of patients with chest pain, particularly women, and is associated with poor cardiovascular prognosis. However, current diagnostic approaches remain cumbersome, and effective treatments are limited. The review explores how genetic markers, particularly SNPs, could aid in risk prediction, disease prognosis, and personalized therapy for CMD.

The study compiles existing findings on CMD-related SNPs, detailing their impact on vascular function, inflammation, and endothelial dysfunction. It also investigates potential genetic links between CMD and other cardiovascular conditions such as coronary artery disease (CAD) and atherosclerosis, identifying shared risk factors that could guide further research.

Notably, the review underscores the pathogenic mechanisms of CMD, emphasizing how SNPs may influence vasoconstriction, endothelial function, and microvascular remodeling.

Additionally, the paper identifies SNPs related to key risk factors such as diabetes, hypertension, and hyperlipidemia, further expanding the scope of genetic insights into CMD.

The findings suggest that a genetics-driven approach could revolutionize CMD diagnosis and treatment, offering a pathway toward precision medicine in cardiovascular health. Future research is expected to focus on validating these genetic markers and integrating them into clinical practice to improve patient outcomes.

This comprehensive review sets the stage for advancing genetic research in CMD, with implications for early detection and novel therapeutic strategies targeting microvascular dysfunction.

Funding Information:
Chongqing Key Project of Science and Technology Joint Medical Research (China) (No. 2019ZDXM013)
Chongqing Talent Program (China) (No. CQYC20210303360)

# # # # # #

# # # # # #

More information: https://www.keaipublishing.com/en/journals/genes-and-diseases/
Editorial Board: https://www.keaipublishing.com/en/journals/genes-and-diseases/editorial-board/
All issues and articles in press are available online in ScienceDirect (https://www.sciencedirect.com/journal/genes-and-diseases).
Submissions to Genes & Disease may be made using Editorial Manager (https://www.editorialmanager.com/gendis/default.aspx).
Print ISSN: 2352-4820
eISSN: 2352-3042
CN: 50-1221/R

Contact Us: editor@genesndiseases.com
X (formerly Twitter): @GenesNDiseases (https://x.com/GenesNDiseases)

# # # # # #

Reference

Dingyuan Tian, Jie Li, Xiaoyue Lai, Qingyuan Yang, Zhihui Zhang, Fang Deng, Single nucleotide polymorphisms: Implications in the early diagnosis and targeted intervention of coronary microvascular dysfunction, Genes & Diseases, Volume 12, Issue 2, 2025, 101249, ISSN 2352-3042, https://doi.org/10.1016/j.gendis.2024.101249

Genes & Diseases Editorial Office
Genes & Diseases
+86 23 6571 4691
editor@genesndiseases.com
