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Index of microcirculatory resistance: state-of-the-art and potential applications in computational simulation of coronary artery disease

Key words: Index of microcirculatory resistance; Coronary artery disease; Computational simulation

Research Summary

This review discuss the research gaps between index of microcirculatory resistance (IMR) and its potential applications in the computational simulation of coronary artery disease (CAD). Computational simulation based on the combination of IMR and other hemodynamic parameters is a promising technology to improve the diagnosis and guide clinical trials of CAD:

- Normal and Pathological Ranges of IMR Values: A Lack of Consistency**
- IMR and CAD: Interaction between the Epicardial and Microcirculatory Dysfunctions**
- IMR in Computational Studies of CAD**

Innovation points

- **Key Role of IMR in Investigating Epicardial and Microvascular Interaction.**
- **The Relationship between IMR and Hemodynamic Parameters in Computational Studies on CAD.**
- **Potential opportunities and Research Gaps of IMR in Computational Studies of CAD.**

Innovation points

Two comprehensive tables were generated to summarize the IMR measurement was performed on healthy subjects and patients with CAD or other diseases (e.g. epicardial atherosclerosis, renal microcirculatory dysfunction), the different viewpoints on the effect of the epicardial (proximal) on microvascular (distal, or microcirculatory) flow resistances in coronary circulation.

Table 1 | Normal and pathological IMR values in different studies.

Table 2 | Interaction between epicardial and microvascular flow resistance.