Nitrite Adjunctive Therapy to Enhance Efficacy of Reperfusion Therapy for Acute Myocardial Infarction

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Technology description

Summary

The treatment of coronary heart disease is a multi-billion dollar market. In the case of acute myocardial infarction (MI), more commonly known as a heart attack, the patient receives a number of diagnostic tests to determine the type and location of the heart damage. Most patients with ST segment elevation are treated with percutaneous coronary intervention (PCI) or thrombolysis. While current therapies, that attempt to reestablish the blood flow and limit ischemia, can be effective, practical delays between symptom presentation and intervention compromise the amount of myocardial salvage. Moreover, the elapsed time prior to PCI is closely related to the clinical outcome. This has resulted in a mortality rate of 7% after MI and nearly all patients suffer from some degree of myocardial necrosis. However, the use of adjunctive pharmacological therapies can improve myocardial salvage following acute percutaneous reperfusion of an acute MI and substantially impact cardiac function.
This technology is a method of using nitrite as an adjunctive therapy to enhance efficacy of reperfusion therapy for acute MI. Evidence suggests that anion nitrite (NO_2^-) is a physiological signaling molecule with roles in intravascular endocrine nitric oxide (NO) transport, hypoxic vasodilation, signaling, and cytoprotection. In addition, nitrite has the characteristics of an ideal adjunctive therapy that now appears ready for translation to human clinical trials.

Application area

Treatment or amelioration of myocardial salvage following acute percutaneous reperfusion of an acute MI.

Advantages

(1) significant cardioprotection after prolonged ischemia, (2) simple administration, (3) low dose for pharmacological action, (4) short half-life (5) minimal side effects, (6) low expense, (7) rapid onset of action. Additionally, the therapy utilizes a cardioprotective mechanism that is not dependent on vasodilation or pressure rate changes. The use and dosing protocols of nitrite, as described by this

technology, could limit MI and apoptosis in the reperfusion phase of injury and provide a remarkable degree of cardioprotection.

Institution

NIH - National Institutes of Health