Staircase Method for Optimized Therapeutic Hypothermia

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Technology description

Introduction

Therapeutic hypothermia is used in patients suffering stroke, cardiac arrest, head trauma, subarachnoid hemorrhage, and in infants after hypoxic-ischemic injury. In several clinical trials published to date, therapeutic hypothermia has failed to show benefits commensurate with the benefit predicted from animal studies. The reasons for these failures are unclear. Without wishing to be bound by any particular theory, the inventors postulate that traditional therapeutic hypothermia cooling/warming schedules failed in human clinical trials due to unappreciated aspects of cerebral pathophysiology. Therefore, there is still an unmet need of therapeutic hypothermia methods and systems.

Technology Description

To meet that need, the inventors have developed an optimized therapeutic hypothermia staircase method that is alternative to the traditional approach. The end goal is to treat, prevent, reduce the likelihood of having, reduce the severity of and/or slow the progression of the condition in the subject. The method wherein a body part of the subject has been affected by the condition for a time period T0, comprises the following step:

a) reperfusing the affected body part for a time period TR;

b) implementing a first temperature transition by initiating hypothermia by changing the temperature of the subject’ s body and/or the affected body part to a first target temperature, and maintaining the temperature of the subject’ s body and/or the affected body part at the first target temperature for a time period of T1;

c) implementing a target temperature transition C1 by changing the temperature of the subject’ s body and/or the affected body part to a second target temperature, and maintaining the temperature of the subject’ s body and/or the affected body part at the second target temperature for a time period of T2; and

d) implementing a third temperature transition C2 by changing the temperature of the subject’ s body and/or the affected body part to a third target temperature, and maintaining the temperature of the subject’ s body and/or the affected body part at the third target temperature for a time period of T3.

Application area

Therapeutic Hypothermia

Advantages

• Time spent at the deepest target temperature is limited to avoid several untoward affects of hypothermia;
• The total duration of hypothermia is a function of the delay to treatment initiation; and
• Target temperature is increased in discrete steps at intervals that can be personalized (rather than ramp rewarming).

Institution

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