Blood Brain Barrier Permeability Imaging to Predict Clinical Vasospasm

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Technology description

Market Opportunity

Delayed cerebral ischemia (DCI) and continued bleeding are the most common causes of death and disability in patients who have suffered aneurysmal subarachnoid hemorrhage (aSAH). aSAH is a life-threatening type of stroke that occurs when an aneurysm (blood vessel burst) leads to bleeding in the space surrounding the brain. DCI in particular occurs in up to 46% of aSAH cases, and is largely due to vasospasm and reduced blood flow in the affected area. As many as 1/3 of patients die following aSAH, while another 1/3 are left with life-altering disabilities. Despite its prevalence and severity, there is no standardized method for identifying patients at risk of DCI post-aSAH.

USC Solution

To improve patient outcomes, researchers at USC have developed a novel method for assessing DCI risk from analysis of standard blood-brain barrier (BBB) permeability imaging. Here, BBB permeability is determined from dynamic contrast-enhanced magnetic resonance imaging (DCE-MRI) and the level of dysfunction is directly correlated with a DCI risk level. In small-scale patient studies, researchers have shown that the BBB permeability levels are indeed distinct enough to successfully predict DCI, which allows patients to receive prompt life-saving care.

Application area

Assessment of patients post-stroke

Advantages

Powerful: Provides first straightforward method for predicting DCI risk
Simple: Risk is inferred directly from standard brain imaging techniques

Institution

University of Southern California

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