Scripps first in West to treat heart attack with new supersaturated oxygen therapy

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A Scripps researcher is using the TherOx system to test the effectiveness of supersaturated oxygen therapy on heart attack patients. Credit: TherOx Inc.

A physician at Scripps Health's Prebys Cardiovascular Institute has become the first in the Western United States to treat heart attack patients with a new supersaturated oxygen (SSO2) system in an attempt to reduce permanent damage to their heart muscle.

The recent treatments of two San Diego men were part of an ongoing clinical trial examining the effectiveness of the experimental SSO2 system and technique in combination with angioplasty, stenting and medication. Scripps is the only site in California participating in the nationwide study called IC-HOT (Evaluation of Intracoronary Hyperoxemic Oxygen Therapy).

"A heart attack is like a house fire, the longer it takes to put it out, the more structural damage that is done," said John C. Harrington, M.D., the interventional cardiologist who is leading the study at Scripps. "By infusing higher concentrations of oxygen into the artery responsible for the heart attack, we can decrease the size of the area of heart muscle that is damaged because it is deprived of oxygen."

Every year nearly 1 million people in the United States have a heart attack, typically caused when the blood flow carrying oxygen to the heart is reduced or blocked. Although the standard for heart attack care is angioplasty and stenting, for many patients those treatments aren't enough to salvage dead or damaged heart tissue that was starved of oxygen.

During SSO2 therapy developed by the Irvine, Calif., biotechnology company TherOx Inc., saline is drawn into a chamber in a disposable cartridge inserted into the treatment system. Supersaturated oxygen is sprayed into a second chamber and mixed with the saline. The patient's blood is circulated through a third chamber where it mixes with the SSO2 saline. The blood-oxygen-saline solution is then directed by catheter into the patient's coronary artery where it infuses the capillary bed and surrounding heart tissue. The procedure takes about one hour.

The IC-HOT study seeks to enroll 100 patients who suffer their first heart attack and receive SSO2 treatment within six hours of first experiencing symptoms. The study's primary aim is to validate the safety

and effectiveness of the therapy system. Enrollment is expected to be completed by February 2017.

In a previous trial of an earlier generation of the TherOx system which didn't involve Scripps, heart attack patients experienced a median reduction of 26 percent in the size of the damaged area of their heart muscle tissue compared to angioplasty and stenting alone.

The treatment of heart attacks has advanced greatly over the past few decades, leading to improvements in mortality rates and decreased hospital stays. Minimally invasive catheter procedures, which deliver stents, angioplasty balloons and other treatments to the heart through veins and arteries, have greatly reduced the need for open heart surgeries.

Still, more needs to be done.

Patients with nearly identical characteristics - age, risk factors and cardiovascular muscle damage from the same type of heart attack—can receive the same treatment but experience very different outcomes.

"One patient may have preserved heart function while the other may have a large area of heart tissue death," Dr. Harrington said. "Clearly there are additional factors that need to be explored to reduce heart muscle damage.

"The hope is that people receiving SSO2 treatment will leave the hospital with a less damaged heart," he said.

Provided by Scripps Health

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