



Chilling Brains Using Nose-Pumped Coolant Aids in Cardiac Care

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By Meg Tirrell

Nov. 16 (Bloomberg) -- Chilling the brains of cardiac-arrest patients as they are raced to the hospital may help reduce neurological damage, a study found. The device used is expected to be sold in Europe in March.

The trial of 182 patients showed that 37 percent treated with the device, which pumps coolant through prongs inserted in the nose, were in good neurological condition when discharged from the hospital, compared with 21 percent with standard care. The research was presented yesterday at the [American Heart Association](#) meeting in Orlando, Florida.

Cardiac arrest shuts off blood flow to the brain, and death can start within 4 to 6 minutes if circulation isn't restored. Resuscitated patients may have brain injuries from lack of oxygen and because restored blood flow can cause inflammation in damaged tissues. Cooling the body slows the brain so it needs less oxygen, and is thought to limit the damage.

"The earlier you can do the cooling, the better," [Maaret Castren](#), a lead author of the study and professor of emergency medicine at the Karolinska Institute in Stockholm, said in a statement. "We now have a method that is safe and can be started within minutes of cardiac arrest to minimize damage during this very critical period."

The device, made by closely held [BeneChill Inc.](#) of San Diego, is designed for use during resuscitation instead of after, working to limit brain damage faster. The company-funded study was done in medical centers across Europe.

No Refrigeration Needed

The device, called RhinoChill, is battery powered and doesn't require refrigeration, which means emergency responders such as ambulance personnel can use it in the field.

Two prongs that run up through the nostrils are attached to a bottle full of liquid coolant. Oxygen bubbles through the bottle, pumping the coolant through the prongs. Each bottle holds enough to chill a person's brain for 30 minutes, and bottles can be exchanged until a patient reaches the hospital.

Doctors now use methods such as cooling blankets and pads or catheters to **reduce the body temperature** of cardiac-arrest patients. Those methods are bulky and difficult to use outside a hospital, and don't directly cool the brain, said Denise Barbut, chairman of BeneChill and senior author of the study.

"The brain really is the target organ, not the heart," Barbut said in an interview. While cooling the brain limits neurological damage, it also makes it easier to get the heart beating again, she said. "The brain is the organ that controls the heart, like a puppet on a string."

Saving Dying Brain

It's also important to lower the brain's temperature because it's the organ that starts dying fastest,

Barbut said. RhinoChill is the first device that enables direct access to the brain, as cooling blankets and catheters depend on chilled blood to circulate through it, she said.

While guidelines established in 2005 by the [International Liaison Committee on Resuscitation](#), or ILCOR, suggest cardiac-arrest patients be cooled, the practice isn't widely done, Barbut said. In Finland, with the highest adherence rates in the world, 61 percent of cardiac-arrest patients receive cooling therapy, while in the U.S., 25 percent do, she said.

In the RhinoChill study, 47 percent of patients survived to hospital discharge after having their brain temperatures reduced using the device during resuscitation, compared with 31 percent who were resuscitated without cooling.

Body Temperature

Patients who received the cooling treatment during resuscitation had an average body temperature of 34.2 degrees Celsius (93.6 degrees Fahrenheit) on arrival at the hospital, while patients given standard care had temperatures on average of 35.5 degrees Celsius (95.9 degrees Fahrenheit). Temperatures were measured at the eardrum, the report said.

Side effects included three nosebleeds and 13 nasal discolorations, according to the report.

RhinoChill received marketing approval in Europe and BeneChill expects to start selling it there in March 2010. The company isn't currently conducting clinical trials in the U.S., Barbut said.

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