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Stem cells help rats recover after stroke

Transplanting brain cells produced from human embryonic stem cells helped fix stroke damage in the brains of rats, according to scientists who hope to test the same thing in people within about five years.

Researchers have been looking for ways to repair the brain damage from a stroke, which can cause permanent disability.

In a published study, researchers at Stanford University School of Medicine in California reported that treatment involving human embryonic stem cells may be a solution.

Embryonic stem cells are the master cells that give rise to every cell and tissue in the body.

The Stanford team reported they restored lost limb function in rats that had stroke-related brain damage.

They induced human embryonic stem cells to develop into neural stem cells that, once transplanted in the rats, developed into neurons and two other important types of brain cells.

The researchers hope to use this approach within about five years in studies involving people who have had strokes.

"We have a lot of evidence that we'll be able to use this kind of stem cell regenerative therapy in patients, including stroke patients," Stanford's Dr Gary Steinberg, who helped lead the study, said in a telephone interview.

Writing in the *Public Library of Science* journal PLoS ONE, Steinberg's team described how they caused strokes in 10 rats and then transplanted neural stem cells into their brains.

The cells made their way to the damaged brain region and incorporated themselves into surrounding brain tissue.

The cells never grew uncontrollably into tumors in lab dishes or inside the rats, the scientists said. The transplanted cells helped repair the stroke damage and enabled the rats to recover lost function in front legs weakened as a result of the stroke, they added.

"It was not quite back to normal but, at least in the rat, it looks like it's going to be close to normal — very impressive," Steinberg said.

"Now remember, this is a rat, not a human. We still have to make that step. But if we could achieve that kind of recovery in humans, we would have a great therapy," Steinberg added.

In a stroke, the blood supply to any part of the brain is blocked. This can occur when a blood vessel bringing blood to the brain is blocked by a blood clot, or when a blood vessel bursts, causing blood to leak into the brain.

If blood flow is halted for more than a few seconds, the brain is deprived of blood and oxygen, brain cells die and permanent damage can result.

Some people oppose the use of human embryonic stem cells on ethical grounds because creating the reservoirs of these cells for use in research involves the destruction of human embryos.