Stem Cells Put To Test

More than a decade after the potential of embryonic stem cells was identified, they are being finally put to test. Dr Steven Schwartz, an eye doctor at the University of California, recently enrolled patients to test the first embryonic stem cell therapy for Stargardt’s macular dystrophy and dry age-related macular degeneration (dry AMD), conditions leading to blindness and which are untreatable. According to latest reports, two of the first patients have successfully undergone the transplant surgery to receive retinal pigment epithelial (RPE) cells derived from human embryonic stem cells (hESCs) and are recovering.

One of the patients had approached Dr Schwartz as a 12-year-old young girl with vision problems and had been diagnosed with Stargardt’s, a common form of macular degeneration in which the light-sensing cells in the central area of vision (the macula) start to deteriorate. The cells stop working and eventually die leading to blindness. Now, as a 26-year-old young woman, she is part of the handful of other patients who are having thousands of retinal pigment epithelial cells, harnessed from human embryonic stem cells, transplanted into their eyes to substitute for the RPE cells in their retina that have been completely destroyed.

Currently both Stargardt’s macular dystrophy and dry age-related macular degeneration are untreatable. Until now, the treatment option has been transplanting RPE cells in the patient’s eyes before the RPE population is completely lost. But what about those whose eyes have already lost the RPE cells?

The trials hold significance and may represent a key step forward in therapeutic stem cell research, especially after all the controversy over embryonic stem cells. The harnessing of stem cells from human embryos had sparked off ethical concerns round the world. Questions were raised whether extracting cells from human embryos would not tantamount to murder as it would destroy the human embryo.

Besides, there were other questions too. Would cells harvested from embryonic stem cells grow into tumours as embryonic stem cells are known for their ability to grow indefinitely? Even if the transplanted cells do not form tumours would they be able to function as desired after transplantation into human recipients? Would they be accepted by the patient’s immune system? How safe and effective such a treatment option would be? Only trials can tell.

A lot, therefore, hangs on these first trials. It has taken years to get to this point. The great promise that stem cells have been known for is ultimately being put to test. Although Dr Schwartz does not anticipate that the early patients would regain their vision completely, but once the safety of the treatment is established then scientists can do further research to figure out at what stage to intervene to get the best results. And once that happens, it could throw open a viable treatment option for several debilitating conditions.

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