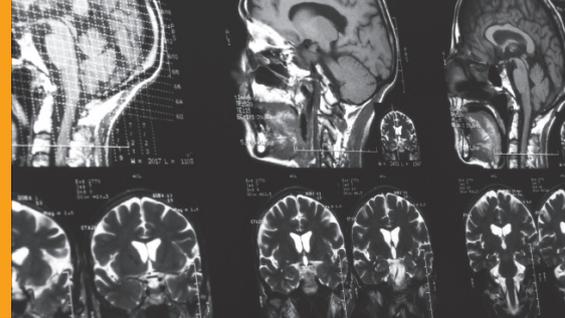


Cerebral Injury

Neurological | Umbilical Cord Blood



Cerebral injury reduces or limits supply of blood and thus oxygen to the brain, resulting in the death of brain tissue. The effects can be severe, life-long or fatal. 1 million people in the UK attend A&E with head injury every year, at an annual cost of over £4.1 billion. Road traffic accidents account for 50% of all cerebral injuries, with young men between their late twenties and mid-thirties being the largest patient population. Meanwhile, patients over 65 years of age most commonly suffer cerebral injury as a result of a fall. Cerebral injury can also be associated with birth, with an incidence rate of between 1.7 and 3 per 1,000 live births. Litigation of birth-related cerebral injury cases in the UK is estimated at £20 million per annum.

Clinical trials

There are currently five clinical trials investigating the use of cord blood as a treatment for cerebral injury in newborn or young children. Some are focusing on the use of allogeneic cord blood to address the fact few children have their own cord blood saved at time of birth. One study is investigating the possible protein changes that occur in brain damage, with a view to understanding the mechanisms and therefore the nature of the damage. This has yet to report.

Other studies are currently in progress and no interim results are available as of yet. The timing and cell dose is part of this investigation.

There is a concern that cells implanted to the brain may not be controllable and could therefore cause further problems. As it is difficult to remove matter from the brain, being able to correct such an issue needs to be avoided. As a result, there is no current work where cells or tissue are directly implanted into the brain.

Cell line

Lund University has developed a mechanism for producing brain cells in the lab. This has helped to understand how brain cells are formed from stem cells.

Animal studies

The clinical trials mentioned are based on strong animal model data, in which the intravenous transfusion of cord blood to rats shows significant improvement in motor and neurological skills. This study also showed the cells migrated to the area of injury and expressed specific neurological markers. There was evidence of the cells integrating to the vascular network at the injury site.

Summary

Cerebral injury research has many parallels with stroke research as the causes are lack of oxygen to the brain resulting in damage. There is a lot of funding and work in this broader area that promises to bring good results in the near future.

References

<http://www.ukabif.org.uk/information/data>

http://www.ukabif.org.uk/index.php?option=com_chronocontact&chronoformname=support

<https://www.headway.org.uk/key-facts-and-statistics.aspx>

<http://clinicaltrials.gov/ct2/results?term=cord+blood+brain+injury&Search=Search>

<http://www.ncbi.nlm.nih.gov/pubmed/12075993>

Cell Transplant. 2002;11(3):275-81. Intravenous administration of human umbilical cord blood reduces neurological deficit in the rat after traumatic brain injury. Lu D, Sanberg PR, Mahmood A, Li Y, Wang L, Sanchez-Ramos J, Chopp M.

<http://www.ncbi.nlm.nih.gov/pubmed/22964590>

Bone Marrow Transplant. 2012 Sep 10. doi: 10.1038/bmt.2012.169. Rescuing the neonatal brain from hypoxic injury with autologous cord blood. Liao Y, Cotten M, Tan S, Kurtzberg J, Cairo MS.

<http://www.sciencedaily.com/releases/2012/05/120524092220.htm>