

Neural stem cells may hold key to combatting newborn brain injury

November 25 2021



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Neural stem cells have strong potential to be effective in reducing brain injury in newborn babies, in the most extensive review of research on the topic.

Injury to the brain during pregnancy, or around the time of birth, can have life-long impact on the offspring including [cerebral palsy](#) and epilepsy, but there are no treatments to regenerate the injured newborn brain.

Neural stem cells (NSCs) are the building blocks of the brain and research is under way to determine how they might be used to boost recovery in injured parts of the brain.

In a review published in *Stem Cells Translational Medicine*, Hudson Institute researchers led by Madeleine Smith analyzed all published pre-[clinical studies](#) and found that NSCs can reduce brain injury and improve physical function following brain injury.

New consensus on neural stem cells

"Neural stem cells are specific to the brain and could replace damaged [brain cells](#) (called neurons) in babies but, until now, no consensus has been reached on their effectiveness," Miss Smith said.

"We are interested in NSCs because unlike other stem cell types, they can integrate into the damaged brain tissue, replacing dead neurons."

"We analyzed and reviewed all available lab-based pre-clinical studies and found that NSCs can reduce perinatal brain injury and can improve physical function following brain injury."

Missing pieces in neural stem cell research

"This study has shown that NSCs have potential to rebuild and reverse brain injury in babies when they are given as a treatment."

"Our review identified the knowledge gaps that need further research to progress this promising treatment to [clinical trials](#)," she said.

Next steps

Miss Smith and the team at Hudson Institute are now using their lab expertise to fill in the missing pieces.

"We don't fully understand how NSCs work and whether they are rejected by the naïve immune system of babies when they are given as a treatment, so I am currently conducting lab-based studies to answer this question," she said.

"Excitingly, stem cell science is evolving all the time and I hope our studies will help babies with [brain injury](#)."

More information: Madeleine J. Smith et al, Neural stem cell treatment for perinatal brain injury: A systematic review and meta-analysis of preclinical studies, *STEM CELLS Translational Medicine* (2021). [DOI: 10.1002/sctm.21-0243](https://doi.org/10.1002/sctm.21-0243)

Provided by Hudson Institute of Medical Research

Citation: Neural stem cells may hold key to combatting newborn brain injury (2021, November 25) retrieved 11 May 2024 from <https://medicalxpress.com/news/2021-11-neural-stem-cells-key-combatting.html>

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