

Hearing With Your Nose? Nasal Stem Cells May Treat Hearing Loss

By Deborah Huso

Stem cell scientists in Australia may have discovered a new way to treat hearing loss suffered in early childhood. And it's not with a hearing aid or special surgery. In fact, the answer to hearing loss may be right under our nose, quite literally.

The findings, published in the journal *STEM CELLS*, found that transplanting mucosa-derived stem cells, a form of rapidly renewing tissues in the nose, can help prevent sensorineural hearing loss during its early stages.

Scientists transplanted adult human nasal stem cells into the ears of mice that exhibited signs of hearing loss. The mice were 4 weeks old, the typical age when hearing loss in mice first becomes apparent. Dr. Sharon Oleskevich, lead study author from the Hearing Research Group at The University of New South Wales, said her research team found improvements in hearing function one month later when compared against age-matched mice that received placebo injections.

"It has been demonstrated in a number of studies that stem cells, such as olfactory stem cells, dental pulp stem cells and hair follicle stem cells have the ability to transform into functional cells of the nervous system," Christian Drapeau, chief science officer of Stemtech International, told AOL Health. "For example, in animal studies, injection of hair follicle

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stem cells in the spinal cord was able to restore mobility."

He says the olfactory stem cells injected in the cochlear cavity could help reverse or protect sensorineural hearing loss in the same kind of way.

"Examination of hearing levels one month post-surgery demonstrated that hearing thresholds in stem cell-transplanted mice were significantly lower than those of mice that received a placebo injection, indicating that transplanted mice were better able to hear less-intense sounds," Oleskevich told AOL Health in an e-mail.

Doctors and researchers are optimistic their research could impact future treatments of hearing loss.

"As the cochlea is a very sensitive organ, the major challenge to this

type of approach is getting a sufficiently large number of cells into the cochlea in a way that does not do further damage," study author Dr. Jeremy M. Sullivan, of Johns Hopkins University, explained to AOL Health. "Another important challenge will also be to determine the mechanisms by which the transplanted cells influence hearing levels."

Sullivan says tracking studies suggest that chemical signaling may be involved and that the transplanted cells may release chemical factors that influence the native cells of the cochlea.

Sensorineural hearing loss occurs when there is a loss of sensory cells in the cochlea, a sensory organ located in the inner ear that enables hearing. This condition can arise during infancy or childhood and is most commonly due to genetic causes.

"Hearing impairments that arise during infancy and childhood can lead to marked deficits in speech and language acquisition, as well as hinder cognitive and psychosocial development," said Oleskevich. She believes the results of this latest study may eventually lead to development of a new treatment for early-onset sensorineural hearing loss.

Drapeau agrees but indicates further study is necessary, particularly with regard to potential complications with the treatment. ■