

New drug halves hearing loss in children following cancer treatment

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Giving the drug sodium thiosulphate after chemotherapy reduces hearing loss in children treated for liver cancer, according to findings published in the *New England Journal of Medicine* today.

Results from the Cancer Research UK funded SIOPEL-6 clinical trial show that giving sodium thiosulphate (STS), after a type of chemotherapy called cisplatin, reduces [hearing](#) loss by nearly 50% in [children](#) treated for hepatoblastoma, a childhood [liver cancer](#).

This is a major step forward in minimising the number of children left with debilitating and long-term side effects after being treated for cancer.

Dr. Penelope Brock, trial lead and paediatric consultant at Great Ormond Street Hospital, said: "We're lucky to have such an effective treatment for this type of liver cancer. But like many cancer treatments, there can also be long term side effects. For children treated with cisplatin alone, a huge proportion are left with permanent hearing loss, which can be utterly debilitating. Even mild hearing loss can severely impact a child's future development. Key consonants are heard at high frequencies like 's,' 'h,' and 'f', and their loss can be particularly difficult for children who haven't yet developed speech.

"This treatment combination could help ensure that parents aren't faced with an upsetting scenario where successful cancer treatment comes at the cost of their child's hearing."

109 children took part in the trial, which was led by researchers at Great Ormond Street Hospital, and had either cisplatin alone or cisplatin followed by STS 6 hours later. While 63% of children given cisplatin alone suffered a degree of hearing loss, this was only the case for one third (33%) of children also given STS, meaning their risk of this side effect was reduced by 48%.

Importantly, there was no difference in overall survival or incidence of cancer returning, meaning the treatment was just as effective if children were given STS.

Professor Pam Kearns, Cancer Research UK's expert on children's cancers at the University of Birmingham, said: "No child should have to suffer a disability as a result of their cancer treatment. Hearing is precious and we're delighted to see that we can safeguard the future development of more children, without compromising the chance of curing their cancer."

Cisplatin is a very effective treatment for many cancers including hepatoblastoma, for which survival has improved dramatically. However, around two thirds of children treated with this drug are left with some hearing loss. This is because while cisplatin is rapidly removed from the body following treatment, it is retained in and damages the cochlea, the portion of the inner ear responsible for hearing.

Preclinical and clinical research, by a team led by Dr. Ed Neuwelt at Oregon Health and Science University, had previously shown that STS could prevent hearing loss caused by cisplatin. Scientists then determined how to delay when STS was given to patients to avoid any interference with cisplatin's effect on their tumour.

In light of these latest results, STS could become part of a new standard of care for treating hepatoblastoma, and researchers are also looking at

whether it could work for other children's cancers where [cisplatin](#) is used as part of treatment. The next step is to get marketing authorisation from the U.S. Food and Drug Administration (FDA) and European Medicines Agency (EMA). It has already received a breakthrough therapy designation by the FDA and will be filed under a Paediatric Use Marketing Application in the EU.

Ollie Simpkin, 12, from Islington, was diagnosed with hepatoblastoma when he was five-months-old. Ollie's mum Philly Simpkin, said: "After eight rounds of chemotherapy and surgery at GOSH, the great news is that Ollie is now [cancer](#) free. While Cisplatin was very effective in shrinking Ollie's tumour, it is a very strong drug which can lead to serious side effects including [hearing loss](#). We are very thankful that this was kept to a minimum for Ollie but he has still lost the top end of his hearing. This means he struggles to hear in big crowds and has to sit at the front of the class. He really wants to learn to play the drums, but we can't risk the damage getting any worse.

"When Ollie was going through treatment, STS hadn't been developed yet, but it's fantastic that this new [treatment](#) could prevent other children from experiencing similar damage that can have such a big impact on their life."

The SIOPEL-6 trial recruited patients from 52 centres in 12 countries. In the UK, the trial coordination was funded by Cancer Research UK. The STS drug was provided free of charge by Fennec Pharmaceuticals.

"International trials like this are crucial to help us improve treatments for children," added Professor Kearns. "The UK is a major contributor to clinical trials research across Europe and this is something we hope will continue. Researchers and patients need certainty on clinical trials both during and beyond the Brexit transition period."

More information: Brock, P, R., et al. Sodium Thiosulfate Protection of Cisplatin-Induced Ototoxicity. *New England Journal of Medicine* (2018).

Provided by Cancer Research UK

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