European Cystic Fibrosis Society

Journal of Cystic Fibrosis
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Cystic Fibrosis Research News

Title:
The implementation of an aminoglycoside induced ototoxicity algorithm for people with cystic fibrosis

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What was your research question?
People with cystic fibrosis (CF) are treated with a lot of antibiotics that can cause hearing damage. This study was done to see if creating a standard process for hearing monitoring would improve monitoring for hearing loss at our CF Center.

Why is this important?
People with CF frequently have infections that are treated with intravenous (IV) and inhaled antibiotics that can damage hearing. Most CF centers do not have standard practices for monitoring people with CF for hearing loss; a previous survey found only nine centers had a standard practice for hearing monitoring and only fourteen were completing routine hearing monitoring.[1] Developing standards for hearing testing (audiograms) is important to make sure that people with CF do not develop long-term hearing loss that is not recognized and treated.

What did you do?
Our CF center did not have a standard process for hearing testing. We developed a standard process that told providers when to order hearing tests for people with CF treated with certain IV or inhaled antibiotics. This standard process used a flow chart to determine when people with CF qualified for initial, follow up and more frequent hearing monitoring (see algorithm below). This allowed us to compare how often hearing tests were done before the standard process was started to how often they were done after. We also determined how often hearing loss was identified, what type of hearing loss had occurred, and what was done to manage the hearing loss.

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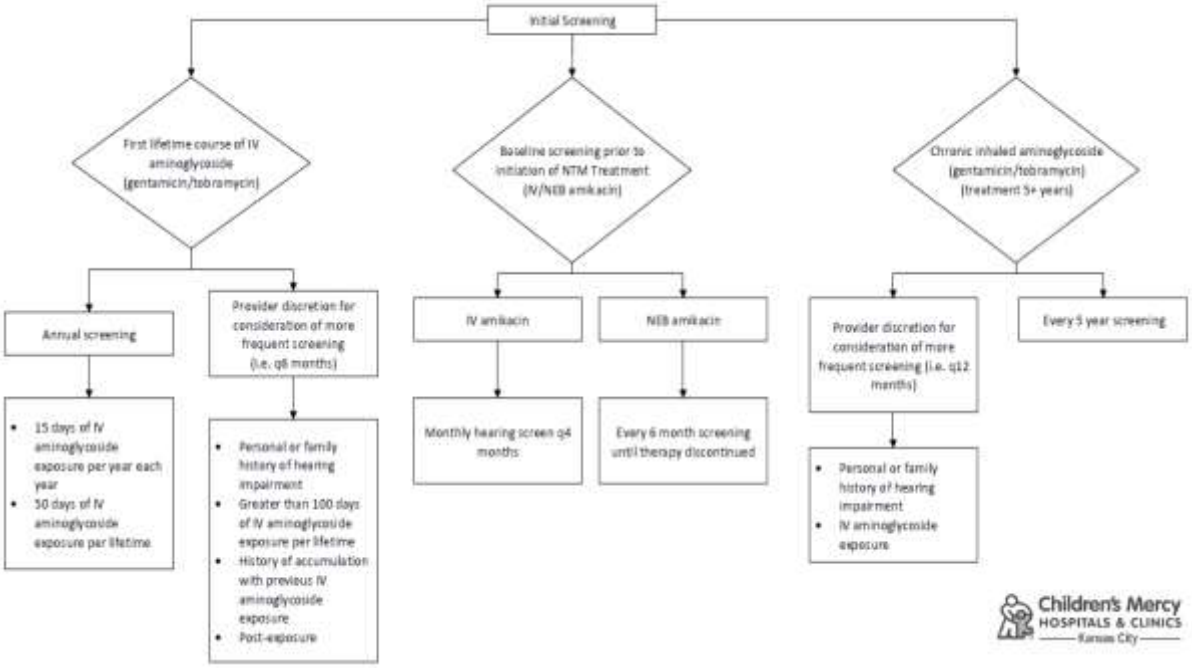
Hearing Monitoring Algorithm



Key: IV, intravenous; NEB: nebulized; NTM: non-tuberculous mycobacteria; q4, every 4; q12, every 12

What did you find?

Before starting the standard process, 27% of people who received IV antibiotics had a hearing test and 26% of people who were treated with inhaled antibiotics had a hearing testing. These percentages increased to 98% and 58% for each group, meaning 70% and 40% improvements. Hearing abnormalities were seen in 63% of people who received IV antibiotics and 53% of people who received inhaled antibiotics.

What does this mean and reasons for caution?

People with CF are at increased risk for hearing loss due to treatment with certain antibiotics. Hearing loss is often not recognized because most CF centers do not have standardized processes for hearing testing. Our study showed that hearing abnormalities are much more common than believed. However, this is only a single center experience so findings at other centers may be different. Developing a standard process is simple and can significantly increase the identification of hearing problems.

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What's next?

We will continue to use our standard process for hearing monitoring. There are opportunities to work with other CF centers through the Cystic Fibrosis Foundation and European Cystic Fibrosis Society to standardize hearing testing for all people with CF. The algorithm is easily to use and can be adopted by CF centers anywhere.

Original manuscript citation in PubMed

https://pubmed.ncbi.nlm.nih.gov/32811788/

References

1. Huynh HQ, Bhakta ZN,Gurgel R, et al. Survey of audiology testing in cystic fibrosis patients who received aminoglycosides for the treatment of acute pulmonary exacerbations. Pediatr Pulmonol 2016;51(S45):431.