Chemotherapy-induced ototoxicity: the unanswered questions

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Background

- Many cancer survivors are now impacted by the multitude of toxicities associated with treatment (1,2).
- The initial toxicities of treatment take priority and it is when these subside the long-term toxicities progress and become increasingly important (3).
- Platinum-based chemotherapy, although highly effective, is known to cause ototoxicity, presenting as high frequency hearing loss which can progress to lower frequencies, and tinnitus (4,5).
- Hearing loss and tinnitus are associated with a higher risk of depression, dementia, social isolation and anxiety (6,7).
- There is little good-quality information and support offered to patients who suffer from ototoxicity, which can potentially lead to many being undiagnosed and untreated.
- Ototoxicity can be permanent and progressive, it is essential that a deeper understanding of ototoxicity and increased awareness of how hearing loss and tinnitus affects quality of life (QoL) of cancer survivors can improve long-term symptoms management and support offered.

Why is this Research Important?

This project aims to research into questions 1, 2, 5, 6, 7 and 19 of the National Cancer Research Institute Living With and Beyond Cancer Questions

Scan to see the top 26 NCRI LWBC Priorities

“I’m still suffering from side effects. I just got fitted for hearing aids last week because of hearing loss. I am happy to be alive, but I can't shake off the dissatisfaction I have with the body treatment left me with (8).”

Aims and Objectives

Cancer

- How can we raise awareness of survival and QoL alike?
- When is the right time to tell patients about permanent toxicities?

Platinum-based chemotherapy

- How does it work?
- Is there enough awareness of long-term toxicities?
- What damage does it do?

Damage to the inner ear

- How many people get hearing loss or tinnitus from chemotherapy?
- How can we protect the ear?
- Is there a specific population that has a higher risk of susceptibility?

Quality of Life

- How is QoL affected?
- Does it correlate with ototoxicity severity?
- Are those with hearing loss/tinnitus more likely to have a lower QoL?

Support

- What support is available?
- Can we raise more ototoxicity awareness?
- Can we implement a more effective support system for those suffering from ototoxicity?

Methodology and Results

Medical Literature

Minimal attention to cumulative platinum- dose

Lack of information on the time onset and duration of ototoxicity

Focus on audiometric thresholds rather than handicap

Lack of high-frequency testing

Minimal consideration of pre-existing cochlear damage

Small and heterogeneous populations

Systematic Review

Systematic review to identify the impact of ototoxicity on QoL

11 studies were included, consisting of RCTs, cross-sectional studies and longitudinal studies

Quality (NIH Quality Assessment Tool) ranged from 21.43% to 85.71%

No reliable prevalence, incidence or severity reported

Lack of standardised diagnostics

Those treated with cisplatin had more hearing loss and tinnitus than any other treatment

Patients with hearing loss and tinnitus had a lower QoL

Online Forum Review

Online forums allow patients to discuss their health experiences

They are a way of obtaining information that the medical literature currently lacks

Posts from publically available forums were thematically analysed using Braun and Clarke’s guidelines

570 messages, 377 members and 9 forums were analysed

Themes included: distress, daily life affected, employment affected

“My hearing drastically changed and the tinnitus began after the last dose. It’s been constant ever since. Better than dead? At this point, I’m wondering. I cannot work with this condition because my job requires proper hearing”.

Mixed Methodology Study

Study to identify the impact on QoL and the specific lived experiences of people suffering from ototoxicity

Identify what support is available and what support is needed

30 participants experiencing hearing loss and/or tinnitus and who have been treated with platinum-based chemotherapy

Methodology includes

- High frequency audiogram
- Interviews
- Questionnaires: THI, HHIA/HHIE, SF-36

Cross Sectional Study

Study to identify the prevalence, severity and impact of ototoxicity

Participants 1-5 years following from platinum-based chemotherapy who have had testicular, breast or ovarian cancer

- High frequency audiogram
- Questionnaires: THI, HHIA/HHIE, SF-36

References

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