

Platinum-based chemotherapy, tinnitus and hearing loss

BY STEPHANIE PEARSON

In recent years, Dave was working with a team at University of Nottingham to consider the effects of platinum-based chemotherapy on hearing and tinnitus. Dr Pearson discusses the group’s findings and the impact of the findings for patients and clinicians alike.

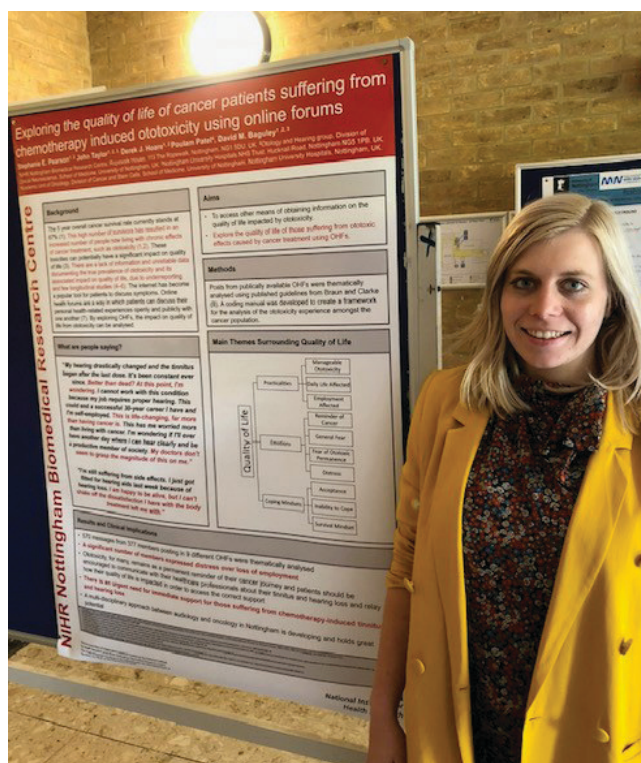
Fortunately, the five-year survival rate of adult cancers is increasing. However, we are seeing for the first time the lasting effects of cancer treatments on people. As more people live with the long-term effects of treatment, such as chemotherapy, it is imperative to understand the impact it has on quality of life. Our research team studies the impact of tinnitus and hearing loss caused by platinum-based chemotherapy and how this effects quality of life in people living with and beyond cancer (LWBC) [1].

Platinum-based chemotherapy, such as cisplatin, carboplatin and oxaliplatin, causes damage to the outer and inner hair cells in the cochlea [2]. The outer hair cells in the basal turn of the cochlea are most susceptible to this ototoxic damage, causing high frequencies to deteriorate (typically above 8 kHz) which can then progress into the lower frequencies. The severity of this hearing loss has been shown to be cumulative with the consequences often being bilateral and permanent. The impact of chemotherapy on the audio-vestibular system is a relatively new field of research and, as such, patients are often unaware and unprepared.

It is well known that hearing loss and tinnitus can cause distress, isolation, anxiety and depression in the general population. However, the addition of other comorbidities, both psychological and physical, caused by cancer and the subsequent treatment can exasperate these issues. Furthermore, it is difficult to assess and explore how hearing loss and tinnitus impact quality of life in those with cancer, without accounting for the confounding factors such as other side effects and worries.

Current literature focuses more on hearing loss than tinnitus, and there are more papers published on children with cancer than in adults. Prof Baguley’s team at Nottingham carried out a qualitative research study and a systematic review that demonstrated adults LWBC that experience hearing loss and tinnitus from treatment had a poorer quality of life compared to those without. Both the literature and our research studies explored similar themes. When carrying out interviews, one participant reported, “I just couldn’t hear, especially if people spoke softly, or women and children’s voices. I just couldn’t hear them” [3]. Fricative phonemes (e.g. /f/, /s/, /v/) rely on the perception of high frequencies which are lost first following ototoxic treatment. For this reason, hearing in

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Dr Pearson alongside a poster presentation on the quality of life of cancer patients suffering from chemotherapy induced ototoxicity. Presented at the Hearing Science Conference at the University of Nottingham.

a noisy environment, even with a mild hearing loss, can have a significant impact on understanding speech.

Tinnitus has also been shown to impede communication as well as cause distress in those LWBC. Another participant reported being unable to engage in normal daily activities due to tinnitus. In addition to other long-term and late effects and how these comorbidities impact an individual, the addition of ototoxicity can impact a person’s independence. Perceived social isolation has negative repercussions on several health outcomes, such as mental health, cognition, physical health and all-cause mortality which highlights the importance of increasing awareness of post-chemotherapeutic social isolation.

In addition to social health, platinum-based ototoxicity can impact employment, cognitive function, mental health and other aspects of life. To reduce these impacts of hearing loss, tinnitus and imbalance, early intervention is crucial. However, there is evidence that baseline measurements of ototoxicity and subsequent monitoring is inadequate. Furthermore, many patients

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felt as though healthcare professionals had not informed them of ototoxicity as a side effect, which caused feelings of anger and distrust. This could cause a breakdown in the patient-clinician relationship. Future research could investigate why these issues exist, which would be beneficial since resolving these issues could increase the speed at which interventions are sought and may prevent further decline in quality of life. In addition, there is relatively less research on imbalance relative to tinnitus and hearing loss, despite it interfering with daily life and increasing the risk of falls and injury. More research should be dedicated to this long-term debilitating effect of chemotherapy.

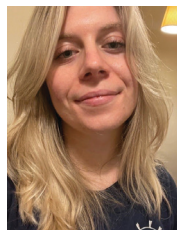
Although the main aim of cancer treatment is survival, the ototoxicity encountered after PBCT, which is often permanent and not preventable, should not be neglected by clinicians and researchers. It is important we direct more of our attention towards this topic to enhance the care of patients and help them adapt to life with hearing loss, tinnitus and imbalance. We should know exactly which aspects of life are compromised in those LWBC so that tailored interventions can be applied to situations where help is needed the most.

References

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