Emergency Cancer Treatment Centre

Imperial College Healthcare NHS Trust

Platinum-based chemotherapy in a young germ cell tumour [GCT] patient with a sensorineural hearing deficit at baseline

Benedicta Harrison[1], Daniel Hoare[1], Joanne Sethi[1], Hannah Ruthven[1], Martin Slater[2], Juliana Yeoh[1], Sarah Mahmoud[1], Catherine Tune[1], Shybi Mohamedkhan[1], Thomas Talbot[1], Mohamed Hariri[1], Michael Gonzalez[1]

[1]Charing Cross Hospital, Imperial College Healthcare NHS Trust. [2]Rare and Inherited Disease Laboratory, NHS North Thames Genomic Laboratory Hub, Great Ormond Street Hospital for Children NHS Foundation Trust.

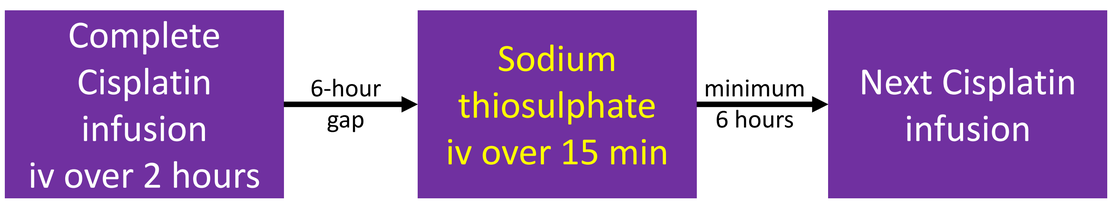
Background

- Platinum-induced hearing loss [PIHL] is encountered to varying extents in approximately 20-32% GCT patients who require either Cisplatin or Carboplatin [1].
- PIHL risk factors in GCT patients: Vincristine or aminoglycoside co-administration, brain surgery, cranial radiotherapy and a genetic susceptibility [2, 3].

Methods

- Here we describe the case of a gentleman age 24 with a UICC Stage 2b mixed germ cell tumour relapse and high-frequency sensorineural hearing deficit present at baseline. The hearing deficit was mild-to-moderate and significant enough to warrant optional bilateral hearing aids prior to systemic chemotherapy with BEP [Bleomycin-Etoposide-Cisplatin].
- Our patient decided to monitor for hearing loss during BEP rather than proceed with bilateral hearing aids.

Figure 2. Sodium thiosulphate administration to prevent PIHL in GCT patients requiring Cisplatin. Sodium thiosulphate dose range: 10-20 g/m^2 [2, 4].

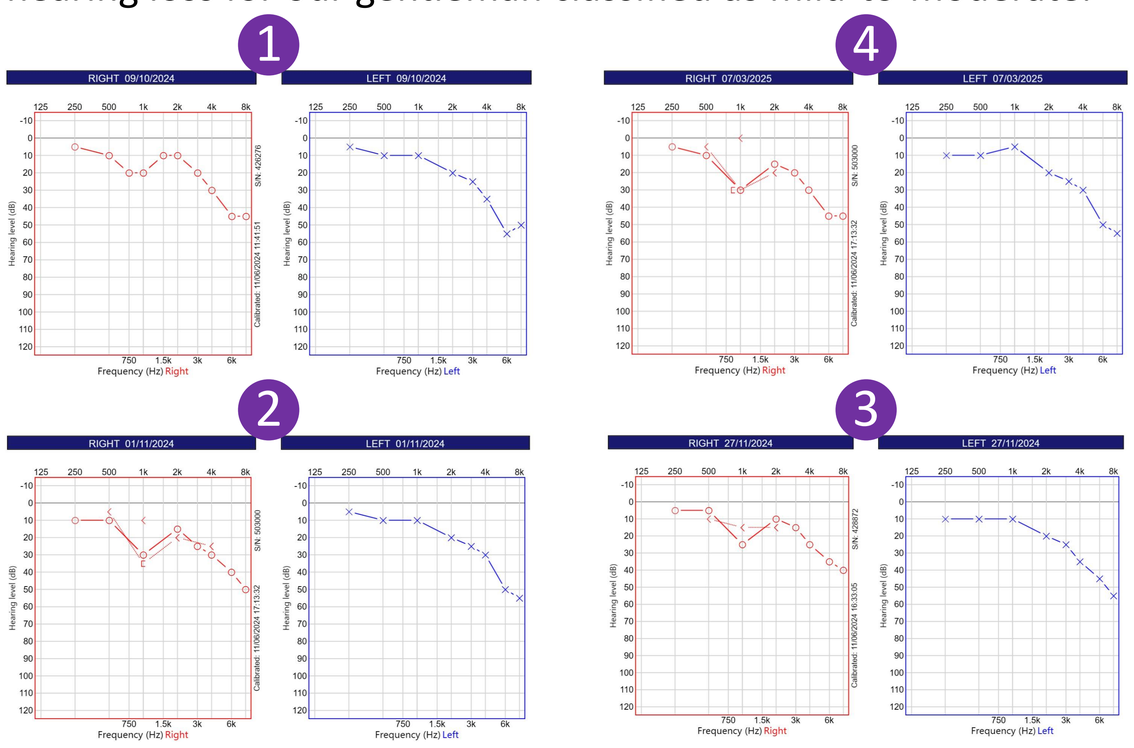


References. 1. Travis *et al*, JCO [2024] 42: 696–706. 2. Meijer *et al*, JCO [2024] 42:2219-2232. 3. Tserga et al, Sci Rep [2019] 9:3455. 4. NICE, https://www.nice.org.uk/guidance/ta1034.

Results

- Mitochondrial DNA analysis excluded both a nonsyndromic aetiology to the deafness and drug predisposition to ototoxicity due to *ribonucleotide reductase 1* [*RNR1*] variants. Anatomical hearing structures were noted to be intact by contrast MRI.
- Curative-intent chemotherapy proceeded with 3 BEP cycles followed by one EP cycle, resulting in a complete symptomatic, radiological and biochemical response.
- Subjectively, minimal PIHL was described after BEP.
- Objectively, audiograms demonstrate minimal change from baseline after BEP chemotherapy **[Figure 1]**.
- The potential for progression from partial to complete deafness impacted the patient experience adversely.

Figure 1. Serial audiograms from baseline. In chronological order: 1. Post-orchidectomy; 2. Prechemotherapy at relapse; 3. Cycle 2 Day 3 BEP; 4. Six weeks post-chemotherapy. First and last audiograms appear on the top row. The sensorineural hearing loss for our gentleman classified as mild-to-moderate.



Conclusion

- Prior to embarking on BEP, our gentleman enquired about the scope for otoprotection from Sodium thiosulphate **[Figure 2]**, recently NICE-approved to prevent PIHL only in infants and children age 1 month to 17 years with localised solid tumours [4].
- The role for Sodium thiosulphate in adult GCT patients warrants a clinical study to: (1) address its efficacy, particularly in at-risk individuals who present with a degree of deafness at baseline; (2) identify any possible adverse impact on clinical outcome within the metastatic setting.