

Sudden hearing loss in a patient of Hodgkin's lymphoma following vinblastine chemotherapy: a rare case report and review of the literature**Akhil Kapoor*, Satya Narayan, Raj Kumar Nirban, Sitaram Maharia, Harvindra Singh Kumar**

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ABSTRACT

Ototoxicity is a well-known complication of certain chemotherapeutic agents. There have been few reports of ototoxicity following administration of vincristine. However, vinblastine has seldom been implicated causing ototoxicity. We report a case of sudden bilateral hearing loss in a 32-year-old male patient of classical Hodgkin's lymphoma following standard adriamycin, bleomycin, vinblastine, dacarbazine chemotherapy.

Keywords: Hodgkin's lymphoma, Ototoxicity, Vinblastine

INTRODUCTION

Ototoxicity is a well-known complication of certain chemotherapeutic agents. Inner ear hair cell loss is the most common pathology seen after ototoxic drug injury.¹ The awareness is limited to platinum-containing compounds such as cisplatin, carboplatin and oxaliplatin. There have been few reports of ototoxicity following administration of vincristine.^{2,3} However, vinblastine has seldom been implicated causing ototoxicity. We report a case of sudden bilateral hearing loss in a patient of Hodgkin's lymphoma following standard adriamycin, bleomycin, vinblastine, dacarbazine (ABVD) chemotherapy.

CASE REPORT

A 32-year-old male smoker diagnosed with Classical Hodgkin's lymphoma Stage IIIB-mixed cellularity type.

Standard ABVD protocol consisting of adriamycin, bleomycin, vinblastine and dacarbazine was planned after necessary work-up. The administration of chemotherapy was uneventful. However, after about 20 hrs of completion of chemotherapy, the patient developed sudden onset of bilateral aural fullness, tinnitus, and bilateral severe hearing loss. Careful history was taken, but it failed to reveal any previous history of otalgia, ear discharge, or noise exposure. There was no history of diabetes, tuberculosis, hypertension or drug abuse. His neurological examination could not reveal any additional abnormality besides bilateral hearing loss. There was a progressive increase in his deafness and it became complete in the next 3 days. Audiometry was performed, and it revealed bilateral severe (66-90 dB) high frequency sloping sensorineural hearing loss. Magnetic resonance imaging with contrast was normal. In the absence of any other suggestive history or ototoxic drug use and the temporal association with the chemotherapy administration, vinblastine was implicated as the culprit drug. There was

gradual improvement in his hearing after 15 days of the first cycle of chemotherapy. From the next chemotherapy cycle, vinblastine was replaced by etoposide. The hearing loss has recovered completely after 3 months of administration of ABVD. At present, the patient is in complete remission and on follow-up.

DISCUSSION

Platinum-containing chemotherapeutic agents, including cisplatin and carboplatin, are associated with cochleotoxicity characterized by high-frequency hearing loss and tinnitus.⁴ Cisplatin and related agents are absorbed by the cochlear hair cells and result in ototoxicity through the production of reactive oxygen species.⁵ There have been reports of vincristine, a vinca alkaloid to produce similar ototoxic reactions. The vinca alkaloids are commonly used for the therapy of various hematological malignancies and solid tumors. They cause arrest of tumor cells during mitosis by binding to tubulin and depolymerization of microtubules. This leads to cell cycle arrest in mitosis.⁶ After intravenous administration, vinblastine has a large volume of distribution, thus, rapid absorption of the drug into the tissues. Despite this property, vinblastine is associated with some side-effects such as peripheral neuropathy, seizures, thrombocytopenia and neutropenia.⁷ Experimental studies in rabbits have concluded that vinca drugs may be associated with degeneration of inner hair cells.⁸ Lugassy and Shapira described in 1990 a 64-year-old patient with multiple myelomas who developed a sudden sensorineural hearing loss shortly after receiving chemotherapy with vincristine.² They concluded that it would be of interest to perform repeated audiograms on patients receiving vincristine, in order to appreciate the actual ototoxicity of this drug. Aydogdu et al. described a 69-year-old male patient diagnosed with multiple myeloma 7 months ago who developed sudden bilateral hearing loss related to vincristine therapy.³

Moss et al. reported a case of vinblastine induced tinnitus and mild high-frequency sensorineural hearing loss in a 29-year-old male patient suffering from Hodgkin's disease and treated with ABVD regimen.⁹ After each cycle, the patient developed tinnitus with an onset of about 6 hrs lasting for 7-10 days. The symptoms disappeared prior to the subsequent cycle of chemotherapy.⁹ Rybak et al. have demonstrated that the combinations of cisplatin/vinorelbine, cisplatin/vincristine, and cisplatin/doxorubicin demonstrated significant synergistic toxicity to hair cells.⁵ They hypothesized that a single anti-cancer drug alone might not be ototoxic, but the combination with other anti-cancer drugs may provide an additional hair cell insult that leads to significant hearing loss.⁵ However, no such combination was used in our patient. Vinblastine has only seldom been reported as an ototoxic agent accountable for sudden, bilateral and symmetrical sensorineural hearing loss.¹⁰ In our patient, vinblastine was implicated as likely cause his hearing

loss as there was well discernible improvement in the hearing on stopping vinblastine. The concomitant chemotherapeutic agents (bleomycin, doxorubicin, and dacarbazine) did not qualify as possible causes either due to the lack of temporal association with the symptoms or no reports of ototoxicity in the literature.

CONCLUSIONS

Acute onset aural fullness, tinnitus and symmetrical severe hearing loss could be regarded as an additional serious, although rare, adverse reaction of vinblastine therapy. Patients who are at higher risk of ototoxicity should be monitored by audiometric studies and hence that ototoxicity can be recognized timely during the vinblastine therapy.

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