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Case Report

Pathogenesis and Management Strategy for Docetaxel Induced Facial Nerve Paralysis

Shekhar Gogna*

Resident General Surgery, Westchester Medical Center, Valhalla, New York, USA

***Corresponding Author:** Shekhar Gogna, Resident General Surgery, Westchester Medical Center, Valhalla, New York, USA.

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Abstract

Docetaxel is used as first line chemotherapy in head and squamous cell cancer. Peripheral sensory/motor neuropathy is a well-known side effect of docetaxel. We want to present a case of reversible docetaxel induced unilateral peripheral facial nerve palsy to identify this unique side effect.

Keywords: Docetaxel; Facial Nerve Palsy; Pathology; Management

Introduction

Chemotherapy induced peripheral neurotoxicity (CIPN) is predominately sensory however few cases of motor, autonomic, or cranial nerve involvement have been reported. Typically, the appearance of CIPN is dose dependent and gradual in onset, although taxanes and platins have been reported to cause immediate neurotoxicities [1]. Docetaxel and paclitaxel cause mixed sensorimotor neuropathy [2]. Cisplatin, oxaliplatin and carboplatin cause pure sensory and painful neuropathy, the important symptoms of which are numbness, tingling, "pins and needles" sensations [3].

Docetaxel is a semi-synthetic analogue of paclitaxel. It has demonstrated clinical activity in head and neck squamous cell cancer, non-small cell cancer of lung, Prostate cancer, gastric cancer & carcinoma breast etc. Neutropenia, hypersensitivity reactions, a fluid retention syndrome, gastrointestinal toxicity, skin toxicity are known side effects [4]. Literature has described association of paclitaxel with facial nerve paralysis [4,5]. Docetaxel induced neuropathy is similar to paclitaxel induced neuropathy [6]. We found infranuclear facial nerve paralysis (Bell's palsy) in our patient after cumulative dose of 440 mg/m^2 of docetaxel in which all other causes of neuropathy were ruled out. To illustrate the clinical association of docetaxel neuropathy this patient is being described along with pathology of disease and management.

Case Report

A 67 yr old male, chronic smoker presented to us with gradually progressive ulcer in floor of mouth for 5 months. Biopsy from the lesion showed squamous cell carcinoma. Disease was staged cT-3N1M0. Patient was planned neoadjuvant chemotherapy followed by surgery. Patient was given Docetaxel (110 mg), Cisplatin (50 mg), 5-FU (1 gm) after every 3 weeks. Patient tolerated 4 cycles of chemotherapy well and there was good response to chemotherapy. However, 7 days after 5th cycle of TPF regimen patient presented to our clinic with sudden asymmetry of face. On examination, he was unable to close left eye (Figure 1) and there was inability to blow air because of left facial weakness (Figure 2).

Figure 1: Patient unable to close left eye.

Figure 2: Patient unable to blow air because of left facial weakness.

The wrinkling over forehead was preserved. There were no constitutional/prodromal symptoms of cough or fever. Neurological, ENT & chest examination of patient were normal. NCCT head, CBC, blood sugar, urea and electrolytes were also normal. There were no clinical features of transient ischemic attacks. Diagnosis of infranuclear facial nerve paralysis (Bell's palsy) was made. Patient was given symptomatic treatment and palsy resolved completely in 14 days.

Discussion

Taxanes exerts its anti-tumor effect by enhancing tubulin polymeration. Paclitaxel and docetaxel are two most commonly used taxanes. The neurotoxic threshold is around 400 mg/m^2 for docetaxel [7]. Our patient also had received total dose of 440 mg/m^2 before developing facial palsy. Neurotoxicity of taxanes is due to damage to axonal transport secondary to excessive tubulin polymerization along with mitochondrial damage to dorsal root ganglion cells [8,9]. Our patient received cisplatin, but it only causes sensory neuropathy. Motor or mixed neuropathy due to platins have not been known to occur. Taxanes are known to cause motor/mixed neuropathies [2]. The incidence of neuropathy varies between 6 - 59% due to taxanes [10]. Paclitaxel has been reported to cause facial palsy [4]. Lee., *et al.* reported bilateral facial nerve palsy as a side-effect of paclitaxel in a case of breast cancer which recovered spontaneously after 23 months [11]. Pathological damage is similar in both paclitaxel and docetaxel [6]. There are several reports of motor/mixed neuropathies due to docetaxel. Hilkens in his experience of 5 cases of peripheral neuropathy induced by docetaxel in 1997 reported sensory disturbance and motor disturbance. The recovery in all the patients was spontaneous without any intervention [12]. A paper by Eckhoff in 2015 reports that docetaxel induced peripheral neuropathy resolved in 77% of patients and persisted in 23% of patients after 1 - 3 years of treatment [13]. However, these were mostly sensory neuropathies. In our patient palsy completely resolved after 14 days. In this paper age more then 55 years was a significant risk factor for docetaxel induced neuropathy, corroborating the age of 67 years in our patient. However, after extensive search of the literature we were unable to find any case of facial palsy due to docetaxel. This is probably the first case due to docetaxel induced facial palsy. There are no established agents recommended for the prevention of neuropathy in patients undergoing treatment with anticancer agents. This is due to lack of evidence and trials. American society of clinical oncology guidelines offer intervention only for neuropathic pain with duloxetine [14]. For motor/mixed neuropathy there are no recommendations. The mainstay of treatment includes prompt recognition of onset of symptoms with subsequent delay of therapy or dose reduction.

Conclusion

Even though the docetaxel can cause a wide range of toxicities, facial nerve palsy can be a rare side effect. For conclusive evidence, all other causes have to be ruled out and multicentric reports are mandatory. Facial nerve palsy due to docetaxel is treated with supportive care. Patient should be fully informed about the potential side effects of the treatment. Prompt reporting should be done of similar cases.

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Conflict of Interest

None.

Grant Received

None.

Bibliography

1. Grisold W., *et al*. "Peripheral neuropathies from chemotherapeutics and targeted agents: diagnosis, treatment, and prevention". *Neuro-Oncology* 14.1 (2012): 45-54.

2. Pachman DR., *et al*. "Chemotherapy-induced peripheral neuropathy: prevention and treatment". *Clinical Pharmacology and Therapeutics* 90.3 (2011): 377-387.

3. Hilkens PH and ven den Bent MJ. "Chemotherapy-induced peripheral neuropathy". *Journal of the Peripheral Nervous System* 4.2 (1997): 350-361.

4. Devita Valizadeh N. "Paclitaxel Induced Peripheral Facial Nerve Pulsy". *Shiraz E Medical Journal* 11.1 (2010): 55-57.

5. Minatani N., *et al*. "A case of facial nerve palsy induced by nab-paclitaxel". *Gan To Kagaku Ryoho* 40.12 (2013): 2375-2377.

6. Fazio R., *et al*. "Docetaxel neuropathy: a distal axonopathy". *Acta Neuropathologica* 98.6 (1999): 651-653.

7. Lee JJ and Swain SM. "Peripheral neuropathy induced by microtubule stabilizing agents". *Journal of Clinical Oncology* 24.10 (2006): 1633-1642.

8. Shemesh OA and Spira ME. "Paclitaxel induces axonal microtubules polar reconfiguration and impaired organelle transport: implications for the pathogenesis of paclitaxel-induced polyneuropathy". *Acta Neuropathologica* 119.2 (2010): 235-248.

9. Annalisa C., *et al*. "Mitochondrial Dysfunction in Chemotherapy-Induced Peripheral Neuropathy (CIPN)". *Toxics* 3.2 (2015): 198-223.

10. Burstein HJ., *et al*. "Docetaxel administered on a weekly basis for metastatic breast cancer". *Journal of Clinical Oncology* 18.6 (2000): 1212-1219.

11. Lee RT., *et al*. "Bilateral facial nerve palsy secondary to the administration of high-dose paclitaxel". *Annals of Oncology* 10.10 (1999): 1245-1247.

12. Hilkens PHE., *et al*. "Clinical characteristics of severe peripheral neuropathy induced by docetaxel (Taxotere)". *Annals of Oncology* 8.2 (1997): 187-190.

13. Eckhoff L., *et al*. "Persistence of docetaxel-induced neuropathy and impact on quality of life among breast cancer survivors". *European Journal of Cancer* 51.3 (2015): 292-300.

14. Hershman DL., *et al*. "Prevention and management of chemotherapy-induced peripheral neuropathy in survivors of adult cancers: American Society of Clinical Oncology Clinical Practice Guideline". *Journal of Clinical Oncology* 32 (2014): 1941-1967.

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