

Case Report

Nail Toxicity Related to Taxane Treatment

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Abstract: Taxanes are a diverse class of chemotherapeutic agents. Cutaneous toxicity has been reported with taxanes and includes erythema and desquamation, involving primarily the hands. Nail changes are described in different series and case reports, but the real incidence of this side-effect is probably underestimated, literature reports that adverse events occur in up to 89% of patients. The nail changes caused by chemotherapy in cancer patients are difficult to assess and often overlooked by clinicians.

Keywords: Taxanes, nails, onycholysis, paronychia, dermatology.

INTRODUCTION

The taxanes, paclitaxel and docetaxel were introduced in the late 1980s, since then, both drugs have proved to be effective in the treatment of a variety of solid tumors including breast, ovarian, lung and bladder cancers. Taxanes exert their cytotoxic effect by reversibly binding the β -subunit of tubulin, thereby inducing tubulin polymerization and inhibiting microtubule depolymerization. A balance between polymerization and depolymerization is needed for normal microtubule function. Taxanes disrupt this balance, leading to arrest at the G2/M phase of the cell cycle [1].

Nail covers the distal phalanx and the continuously dividing matrix cells generate the nail plate. Cancer chemotherapeutic agents may lead to nail changes as they affect these rapidly dividing nail matrix cells [2,3]. Taxane-induced dermatologic adverse events have been reported to occur in up to 89% of patients, nail changes have been shown to occur in 34.9% of patients receiving docetaxel and in 43.7% of patients receiving paclitaxel. It may affect all the nails or some and shows a temporal relationship to drug intake [4,5,6]. The clinical presentation of chemotherapeutic induced nail changes depends on the component of nail unit involved and the duration and severity of toxicity [2]. Nail toxicity can occur in several ways such as melanonychia, leukonychia, Beau lines and onychomadesis, onychorrhexis, koilonychias, onycholysis, paronychia, subungual hematoma, and hemorrhagic onycholysis, which are secondary to direct cytotoxic effects, antiangiogenic properties, and/or neurogenic inflammatory process [6]. The nail changes are usually but not always transient and disappear on drug withdrawal [4].

We presented a case of nail toxicity characterized by onycholysis in a patient diagnosed with ductal carcinoma in treatment with docetaxel.

CASE PRESENTATION

A 74-year-old female with a history of invasive ductal carcinoma of breast (EC IV due to lymph node involvement), triple-negative immunophenotype, presented evidence of active tumor in bilateral cervical, mediastinal, and left axillary lymph nodes diagnosed in June 2022. She received 6 cycles of docetaxel and underwent surgical resection of the left axillary lymph nodes in April 2023. Capecitabine was initiated as maintenance therapy but showed disease progression. Therefore, treatment with eribulin mesylate was started in June 2023. Subsequent PET-CT scans revealed new

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progression with a 10 mm frontal lesion involving the central nervous system. Whole-brain radiotherapy was initiated along with docetaxel 75 mg/m² every 21 days. Patient presented with nail changes and periungual pain of 2 months of evolution, clinical examination showed onycholysis, onychorrhexis and slight paronychia erythema surrounds some of the nails beds.



Figure 1: Showing onycholysis, onychorrhexis and slight paronychia erythema surrounds some of the nails beds



Figure 2: Showing onycholysis, onychorrhexis and slight paronychia erythema surrounds some of the nails beds

DISCUSSION

Taxanes are one of the most common cancer chemotherapeutic agents causing nail toxicity. Most of the cases have been attributed to docetaxel after a variable schedule of administration or combination therapy [2]. Various nail changes have been reported with docetaxel including onycholysis, transverse leukonychia, purulent discharge, acute paronychia, nail ridging, Beau's lines, subungual hemorrhages, and hyperpigmentation of hyponychium [2]. Hemorrhagic onycholysis is characteristic of nail toxic effects induced by taxanes and is more frequent with docetaxel than with paclitaxel. Taxane-related onycholysis is sometimes associated with inflammatory erythema of dorsal hands or perimalleolar and Achilles areas, which was proposed to be known as periarticular thenar erythema with onycholysis (PATEO syndrome) [7]. The pathophysiology of taxane-induced onycholysis remains fully known [8], however, two hypotheses have been suggested to explain taxane-induced nail toxicity: neurogenic inflammation due to neuropeptides release or the effect of prostaglandins via sympathetic fibers [2].

Preventive measures to avoid/decrease chemotherapeutic induced nail toxicity focus on minimizing the pressure, trauma, and friction on the nail unit. These include avoiding irritants like frequent water immersion, wet work, corrosive chemicals, avoiding aggressive manicure, acetone, artificial nails, nail biting, cutting nails too short, and encouraging frequent application of emollients like petroleum jelly to the nail plate, filing the edges to smoothen the corners of nail plate, and promoting wide and comfortable footwear. It is important to maintain appropriate hygiene to avoid secondary infection. Use of frozen gloves and socks can be an effective preventive measure for taxane-induced toxicity, and may

prevent nail and cutaneous hand or foot toxic effects as the cold temperature reduces both cellular metabolism and drug distribution. Dark-colored nails may prevent photo-induced onycholysis, but it is yet to be established. Treatment with biotin may be helpful, but it is yet to be established [2, 8, 9].

Most of the nail toxicities once developed can be managed conservatively. Since nail growth is a slow process, there is no effective means to reverse nail abnormalities arising secondary to transient arrest of nail matrix mitotic activity. It is important to counsel the patient that the nail changes will disappear with the nail growth but this may take months. Usually, it is not recommended to withdraw the drug as; In case of periungual inflammation topical application of corticosteroids and calcineurin inhibitors may be helpful, also antibiotics if culture positive/infected [1].

CONCLUSIONS

Nail changes are frequently observed in patients treated with anticancer agents. Clinicians should be aware of paclitaxel-induced nail toxicities. Patients experience this side effect as a problem impairing their quality of life. Every physician should provide adequate information to the patients about the expected side effects based on the chemotherapeutic agents, and minimize the risk of occurrence.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest at the time of publication of this article.

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