International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

Docetaxel Induced Nail Changes: A Case Report

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Abstract: ***Introduction: Docetaxel is chemotherapeutic drug belongs to taxane classification, used in the treatment of various type of cancers such as breast, stomach, head and neck. Docetaxel encounters various Adverse Drug Reactions among which nail changes are commonly observed i.e nail bed purpura, onycholysis, nail pigmentation, splinter hemorrhage have been reported. Worldwide incidence of patients developing nail changes range from 0% to 44%. Case presentation: A 41 Years old female patient came to oncology daycare with nail dis-colouration. she was on treatment with docetaxel 3rd cycle chemotherapy for breast cancer. on physical examination, all her nails revealed the dis-coloration which was gradually increasing. Conclusion: Several research studies shown similar adverse drug reaction with prolonged use of docetaxel and care should be taken in identifying and educating the patient in dos & don't s of nail care as it hinder their adherence to the medication.***

Keywords: Docetaxel, Nail-discoloration, Nail onycholysis, Nail changes

1. Introduction

Among the various chemotherapeutic agent's available paclitaxel play an important role in managing various cancers like breast, lung, prostate, and stomach cancers. It inhibits the cell division by stabilization of microtubules , inhibits the mitotic spindle formation, induction of apoptosis which as a combined effect in exhibiting the anti-tumour effect. Docetaxel has high potential in wide range of side effects and adverse reactions including bone marrow suppression, hypersensitivity reactions, alopecia, gastro intestinal disturbances and neuropathic pain etc. Nail toxicity is one of the frequently encountered effects of docetaxel and taxane derivatives. The nail toxicity can occur in various stages and types. The nail toxicity or changes during taxanes or docetaxel derivatives are

1) **Nail Fragility**: Brittleness occurs due to which easy nail breakage is seen.
2) **Nail Dystrophy**: This is presented as irregular nail texture, ridges, or changes in shape.
3) **Onycholysis**: Nail is detached from nail bed.
4) **Discoloration**: Nails may become discoloured, presenting as yellowing or darkening.
5) **Thickening**: Nails might thicken due to onchylosis and keratosis.
6) **Increased Cuticle Sensitivity**: The area around the nail may become inflamed or tender.
7) **Paronychia**: Inflammation or infection of the skin around the nails can occur.

The mechanism behind docetaxel-induced nail toxicity is mostly idiopathic but it is thought to be related to the drug's effect on rapidly dividing cells. Individual patient susceptibility place an important role in the toxicity occurrence other drug related factors which may triggers such reaction are dosage, duration of treatment can affect the severity of the event.

The type of cancer plays an importance role in deciding the dose of docetaxel, usually the recommended doses are follows

- **Breast cancer:** 75 mg/m² administered intravenously every 3 weeks.
- **Non-small cell lung cancer:** 75 mg/m² every 3 weeks or 37.5 mg/m² weekly.
- **Prostate cancer:** 75 mg/m² every 3 weeks, often in combination with prednisone.
- **Gastric cancer:** 60-75 mg/m² every 3 weeks.

Monitoring parameters like complete blood analysis, liver function test should be usually carried out during the therapy. Using corticosteroids as an adjuvant or as pre-medication has said to have reduced the incidence of hypersensitivity reactions related to docetaxel.

Though nail changes are often mild and generally resolve on its own after treatment cessation. Care should be taken and prompt awareness should be given to patients as it can also induce severe pain and nail bed haematomas. All these factors can reduced the quality of life in the patients and also hinder the medication adherence. Patients experiencing significant nail changes should be advised to consult their healthcare provider for management strategies.

Currently, there are no known preventative measures for the nail changes as mostly it is dose dependent and it generally resolves spontaneously after the treatment is stopped. Corticosteroids can be used in severe cases to manage the symptoms. These can be managed using cold therapy, using nail cooling gloves or ice packs during infusion may help reduce nail damage. Home remedies like using a cuticle oil for moisturizing, using gentle cosmetic products on nail, maintaining nail hygiene, trimming nail may avoid worsening.

2. Literature Survey

1) Mi Rung Roh et al. discussed on 2 case reports on docetaxel induced oncylosis . in which patients developed subungal haematomas, hemopurulent discharge, dyschromasia, dystrophy, onycholysis, hemorrhages upon treating with docetaxel for 4 months.
2) Minisini et al, in their article on taxane induced nail changes reported 55-year-old breast cancer patient presenting with beau's lines and onchylosis with suppuration of fingers and toe nails after treated with docetaxel 35mg/m^2/week. Similar case in 61-year-old lung metastatic from breast cancer treated with docetaxel 75mg/m^2 developed paresthesia of fingers and toes with unremarkable electromyography.
3) Aurora Alessandrini et al. performed a retrospective clinical study of 79 patients with taxane induced nail changes which revealed Paclitaxel was the most responsible drug and both hands and feet were often affected (46.8%). Grade 2 nail toxicity was seen in 63.3% of the patients, including painful subungual hematoma, haemorrhagic onycholysis, and paronychia. Grade 3 nail toxicity was seen only in 2.5% of the patients, including haemorrhagic onycholysis and pyogenic granuloma. Removal of the detached nail plate with application of topical anti- biotics and steroids induced regression of symptoms within 2 weeks.
4) Qamar Ghafoor et al reported a case of 66 year old gentleman who received docetaxel chemotherapy for non-small cell lung cancer. Over the duration of his treatment nail changes were noticed which involved dyspigmentation of the nail plates in addition to erythema and the formation of nail ridges. It was classified as grade 1 nail toxicity using the National Cancer Institute grading system.
5) Junshik Hong et al. conducted a prospective analysis in patients with advanced Non- small cell lung cancer who received first -line docetaxel/ cisplatin combination chemotherapy. 26% of patients developed nail changes, including 11% with grade 3. Most occurrence of nail changes were diagnosed in patients who were treated with weekly schedule. The number of chemotherapy cycles and cumulative docetaxel doses were strongly associated with the development of nail changes.

3. Case Presentation

A 41 years old female patient came to oncology daycare for the breast cancer 3rd cycle chemotherapy. She complained on nail discoloration, on the physical examination it was seen that she had developed the dis-colouration on all the nails of her hands and toes, even the nail bed purpura was observed which was gradually increasing. Upon reviewing the treatment chart, she was treated with Docetaxel branded Doce Aqualip 100mg intravenously given in 500ml of normal saline. Other drugs which were given are injection Emeset 8mg, injection Rantac 50mg, Inj Dexamethasone 12mg, Inj Avil 2cc to avoid nausea, vomiting and hypersensitivity reaction respectively. Inj PEG G-CSF 50mg subcutaneously to avoid opportunistic infections during chemotherapy. No evident drug interactions were seen. Upon follow up with the patient it was also seen that the discoloration started reducing as the days passed. Culture test was not done as the effect was mild.

4. Results

Although physical examination and sufficient literature on the similar incidence gives the base for obtaining causal relationship with the event, NARANJO's ADR Probability scale was used to assess the casual relationship between docetaxel and identified clinical event which revealed that the adverse drug reaction is definite with score of 10. The patient exhibited grade 1 toxicity according to National Cancer Institute grading system.

Figure 1 and 2 shows the nail discoloration and nail bed purpura after receiving docetaxel therapy

5. Conclusion

Several research studies shown similar adverse drug reaction with prolonged use of docetaxel and care should be taken in identifying and educating the patient in dos & don't s of nail care as it hinders their adherence to the medication. Currently, there are no known preventative measures for the nail changes and it generally resolves spontaneously after the treatment is stopped. These can be managed using cold therapy, using nail cooling gloves or ice packs during infusion may help reduce nail damage.

6. Future Scope

Nail culture test has to be encouraged which helps to formulate the antibiotic regimen in severe loss of nails as

those patients will be prone to opportunistic infections. Similar studies on larger population gives an insight to develop a prophylactic agent.

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