An Atypical Dorsal Presentation of Paclitaxel-Induced Acral Erythema

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Abstract

Acral erythema is a relatively common cutaneous reaction to a variety of anti-neoplastic agents, typically involving the palms and soles. The occurrence of paclitaxel-induced acral erythema is rare (1.5%) and affects the dorsal hands and/or feet, sparing palmar/plantar surfaces, for reasons unknown.1 We present a case of paclitaxel-induced acral erythema affecting the dorsal hands and forearms in a 73-year-old female undergoing chemotherapy for ovarian cancer.

Introduction

Acral erythema, also known as palmoplantar erythrodysesthesia or hand-foot syndrome, is a cutaneous side effect of many conventional chemotherapies, most commonly doxorubicin, 5-fluorouracil, cytarabine, and docetaxel.1 Patients present with painful, burning erythema of the palms and/or soles associated with swelling, parathesias, and desquamation. Rarely, the chemotherapeutic agent paclitaxel causes acral erythema, and it presents atypically, on the dorsal hands and/or feet.2-8

We report the case of a 73-year-old female with ovarian cancer receiving combination treatment with paclitaxel and carboplatin who developed paclitaxel-induced acral erythema. A thorough literature review found only six case reports and one prospective study discussing this atypical presentation of acral erythema that is specific to paclitaxel.2-4 Clinicians informed of this phenomenon will be better able to advise their patients undergoing treatment with paclitaxel, a chemotherapy agent commonly used to treat ovarian, breast, lung, and head and neck squamous cell cancer.

Case Report

A 73-year-old female with ovarian serous carcinoma was undergoing treatment with paclitaxel/carboplatin chemotherapy. During the third cycle (third month of three weekly infusions), she developed a burning sensation that progressed to pain with erythema and edema of bilateral dorsal hands and fingers. The patient was subsequently admitted to the hospital for a small bowel obstruction related to metastases, at which point the rash was assessed by her primary team. An ultrasound of bilateral upper extremities ruled out deep venous thrombosis. Dexamethasone 10 mg and diphenhydramine 25 mg were administered intravenously, which temporarily improved her redness, swelling, and pain.

Physical exam by dermatology revealed non-tender, erythematous, edematous plaques of the bilateral dorsal fingers and hands and extending about a third of the way up the forearms (Figure 1). There were a few areas of desquamation but no blisters, erosions, or ulcerations. Palmar hands were spared (Figure 2). Nails could not be assessed due to acrylic overlay. Feet were largely uninvolved with the exception of one small erythematous patch with central crust overlying the dorsal aspect of the left hallux. There was no tenderness on palpation or restriction of movement. She admitted to mild constant pain of the hands but denied pruritus, numbness, tingling, and muscle weakness.

Based on past reports of cutaneous reactions to paclitaxel presenting atypically on dorsal hands and/or feet, the absence of any reports of acral erythema caused by carboplatin, and the fact that she did not experience acral erythema with repeat dose of carboplatin monotherapy, the patient was diagnosed with paclitaxel-induced dorsal acral erythema. According to the National Cancer Institute criteria for classification of hand-foot syndrome, our patient had Grade 2 disease (Table 1). She was instructed to use cold compresses and triamcinolone 0.5% cream. She was educated that the symptoms should resolve in two to four weeks and that re-administration of paclitaxel would likely cause recurrence of acral erythema in this distinct pattern. She was advised to elevate arms and apply cool compresses to decrease the amount of drug delivered to the hands during subsequent paclitaxel administration.

Discussion

Since its first use as a chemotherapeutic agent in 1957, paclitaxel has been associated with a wide array of dermatologic side effects, including alopecia totalis, mucositis, onycholyisis, hypersensitivity reactions (with erythema and urticaria), radiation recall dermatitis, erythema multiforme, bullous fixed drug eruption, pustular eruption, and sclerodermalike cutaneous lesions.8 Acral erythema is a rare cutaneous reaction of paclitaxel administration. In one prospective study, two out of 127 patients receiving paclitaxel developed acral erythema, both cases involving the dorsal hands only.5 Hand involvement tends to occur earlier and with greater severity than foot involvement.8

The exact pathogenic mechanisms of chemotherapy-induced acral erythema remains undetermined. Acral erythema may be confined to the hands and feet due to certain physical factors such as temperature gradient and vascular anatomy, rapid cell turnover, and thick stratum corneum.4 In addition, one study discovered anomalous expression of intracellular adhesion molecule-1 in eccrine ducts in patients with acral erythema, suggesting that keratinocytes in the eccrine apparatus may favor natural killer cells, leading to direct cytotoxicity.11 Hypotheses of graft-versus-host disease have also been proposed based on histological findings.5,12 The relationship between chemotherapy dose and lesion severity, as well as the fact that symptom resolution always occurs after drug withdrawal, seem to support the direct cytotoxicity hypothesis. If the drug is not discontinued, the eruption often progresses either to intense edema and blisters or to fissured palmoplantar keratoderma.6 Total resolution of acral lesions is usually seen within two months of stopping the offending chemotherapy.6

Conclusion

Although the definite mechanism behind paclitaxel-induced acral erythema remains unknown, knowledge of the atypical dorsal presentation will help clinicians recognize this entity sooner, and better advise their patients.

Table 1. National Cancer Institute criteria for classification of hand-foot syndrome

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<tr>
<th>Grade</th>
<th>Characteristics</th>
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<tr>
<td>1</td>
<td>Minimal skin changes or dermatitis, without pain</td>
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<tr>
<td>2</td>
<td>Skin changes (e.g., peeling, blisters, bleeding, edema, or hyperkeratosis), with pain that limits instrumental activities of daily life</td>
</tr>
<tr>
<td>3</td>
<td>Severe skin changes, with pain that limits self-care activities of daily life</td>
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References


