

# Leprosy: type 1 reaction precipitated by doxorubicin and cisplatin

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**Abstract** Type 1 reaction (T1R) in leprosy is common and characterized by increased inflammation in skin lesions or nerve. Besides antileprotic therapy, T1Rs are associated with intercurrent infection, pregnancy and drugs. Also, T1Rs may be a presenting feature of leprosy. We report a case of T1R in leprosy presenting as drug reaction during cancer chemotherapy with doxorubicin and cisplatin. We propose to explain this unusual occurrence by highlighting the increased production and expression of TNF- $\alpha$  by these drugs. Thus, physicians using these drugs should keep this unusual adverse effect in mind.

**Key words**

Anticancer chemotherapy, type 1 leprosy reaction, tumor necrosis factor- $\alpha$ .

## Introduction

Type 1 reaction may be a presenting feature of leprosy or may occur during multidrug treatment (MDT). A type 1 reaction (T1R) is characterized by acute inflammation in the existing skin lesions and may be accompanied by neuritis. Borderline disease is a strong risk factor for the occurrence of T1Rs<sup>1</sup> but small numbers of patients with the polar forms of leprosy may also experience T1Rs. Skin lesions become erythematous, edematous and may ulcerate. Edema of the hands, feet and face can also be a feature of a reaction but systemic features are less common.<sup>1</sup>

We describe a case of leprosy with type 1 reaction masquerading as drug reaction due to anticancer chemotherapy.

## Case report

A 58-year-old woman was referred to our clinic from the oncology section with large erythematous scaly plaques on the face. The patient had developed these lesions (**Figure 1**) after receiving anticancer medicines for ovarian adenocarcinoma (**Figure 2**). She could recall that she had two or three ill-defined, slightly raised areas on her face before starting chemotherapy. These lesions previously had not been of any importance to the patient and consequently she had not sought medical attention.

Chemotherapy had been given with doxorubicin and cisplatin for two cycles. After 4 to 5 days of the first cycle she developed tenderness and elevation of the patches on the face. After the second cycle all the lesions merged to well defined erythematous large plaques whence she was urgently referred to the dermatology clinic to rule out adverse drug reaction to chemotherapeutic drugs.

On examination, the patient was febrile. We

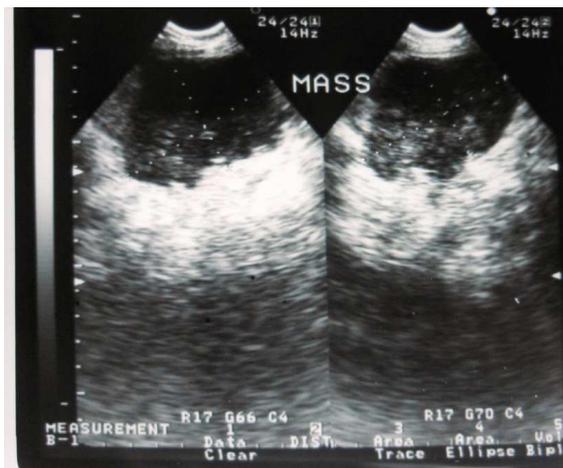
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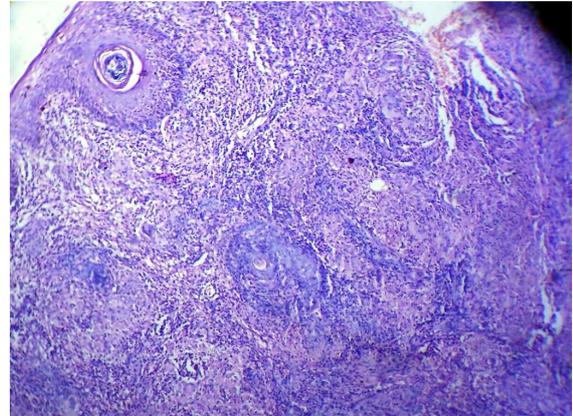


**Figure 1** Type 1 lepra reaction following chemotherapy



**Figure 2** Ovarian mass seen in ultrasonography of abdomen

noticed well-defined, erythematous plaques on the face with dry, scaly surface. The plaques were warm; sensation (as regards touch and temperature) was slightly impaired. The right ulnar and common peroneal nerves were thickened and tender. There were no other hypoaesthetic, anesthetic or hypopigmented areas anywhere in the body. Biopsy was taken and slit skin smear examination was done from



**Figure 3** Histopathology in 100x with H&E stain showing tubercular granuloma with dermal edema.



**Figure 4** Subsiding type 1 reaction.

the lesion. The hematoxylin-eosin stained biopsy section (**Figure 3**) revealed tubercular granuloma with dermal edema. Acid-fast bacilli were neither present in biopsy nor in slit-skin smear.

Considering the clinical features and histopathology findings, a diagnosis of borderline tuberculoid leprosy with type 1 reaction was reached. Treatment was started with prednisolone 40 mg daily with H<sub>2</sub> blocker and multibacillary multidrug therapy for adults [MDT MB (A)]. Within next 2 weeks the reaction subsided to a large extent, leaving

behind a mildly erythematous hypoesthetic plaque (**Figure 4**).

She continues with the anticancer chemotherapy along with multidrug therapy for leprosy. She did not have any more of the 'drug rashes'.

### **Discussion**

Dermatologic side effects of cancer chemotherapy are important due to their visibility and common occurrence. Doxorubicin causes acral erythema, radiation recall, hyperpigmentation and alopecia amongst other cutaneous effects.<sup>2</sup> Injection of cisplatin may be accompanied with local redness with itch as sign of hypersensitive response.<sup>3</sup>

Leprosy is common in India and has varied clinical presentations. The course of the disease may be complicated by immunologic phenomena called reactions. Of them, type 1 reaction is delayed hypersensitivity reaction that occurs predominantly in borderline leprosy and is characterized clinically by inflammation and enlargement of existing plaques, often with neuritis. Histologically, there is edema in and around the granuloma, the granulomas themselves becoming more epithelioid in nature.

Tumor necrosis factor  $\alpha$  (TNF- $\alpha$ ) is considered to be an important cytokine mediator in antigen presentation, granuloma formation and reversal reaction.<sup>4,5,6</sup> Doxorubicin, on the other hand, stimulates TNF expression by immune cells in humans.<sup>7</sup> Cisplatin has also been demonstrated to generate  $O_2^-$  anion in a cell-free system activating the transcription factor NF- $\kappa\beta$ , which in turn stimulates the production of TNF- $\alpha$ .<sup>8</sup>

### **Conclusion**

Leprosy and its reactions are great mimickers. In the present case, the diagnosis was erroneously

made as a drug eruption. To the best of our knowledge, the occurrence of T1R after anticancer chemotherapy has not been reported previously in the literature.

TNF- $\alpha$  produced in excess, during treatment with doxorubicin and cisplatin may be the reason for induction of T1R in this otherwise asymptomatic patient of borderline tuberculoid leprosy.

Hereby we seek to emphasize upon the recognition of the possibility of a T1R being precipitated after chemotherapy with doxorubicin and cisplatin.

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