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Case Report

Pesticide-induced porphyria cutanea tarda

Fawad Muzaffar, Amer Ejaz

Department of Dermatology, Combined Military Hospital, Kharian, Pakistan.

Abstract Porphyria cutanea tarda (PCT) is the most common type of porphyria which results from the deficiency of a hepatic enzyme called uroporphyrinogen decarboxylase. It can be precipitated by different drugs, chemicals or diseases. Herein, we report a case of PCT caused by use of pesticide.

Key words

Porphyria cutanea tarda, pesticide, DDT, thiodan, dithene M45.

Introduction

Porphyria cutanea tarda (PCT) is the most common type of porphyria.¹ Polyhalogenated cyclic hydrocarbons are one of its rarer precipitating factors.^{2,3} They are commonly used as pesticides and fungicides.^{2,3} In regional literature there was no reported case of pesticide or fungicide-induced PCT. We report a case that developed the disease as a result of ingestion of fruit treated with these chemicals.

Case report

A 29-year-old male resident of District Faisalabad, Pakistan presented with a one year history of small blisters and erosions over the back of both hands. He also complained of intermittently passing red colored urine since childhood.

Eight years earlier, when the patient joined the army, he noticed that whenever he wore new army boots he developed small

blisters and erosions over the dorsa of both feet and lower legs.

Two years ago, he was posted to an altitude of 15,000 feet above sea level at the Siachen Glacier area. During this tenure, he noted a change in the growth pattern of his beard. It had extended to his upper cheeks with an increased growth over both temples.

Last year the patient started developing small blisters over the backs of both hands on trivial trauma. The blisters were small, filled with clear fluid and ruptured in seven to ten days. These were followed by the sequential formation of erosions, crusts, scars and eventual hyperpigmentation. Exposure to sunlight caused itching and an increase in the number of erupting lesions. The patient reported a mild regression of the disease during the past winter.

The patient's family profession was fruit farming and he gave history of ingestion of large quantities of unwashed pesticide and fungicide treated fruits from the family orchards since childhood. D.D.T. and thiodan were used as pesticides and dithene M45 was used as fungicide on his

Address for correspondence

Dr. Fawad Muzaffar,
12, Askari-VIII, PAF Base Road,
Chaklala, Rawalpindi, Pakistan.
Tel: 0092 333 550 3214, 0092 51 595 2022
E mail: fuad_muzaffar@yahoo.co.uk



Figure 1 Dorsa of both hands of the patient showing atrophic scars, hypo- and hyperpigmentation

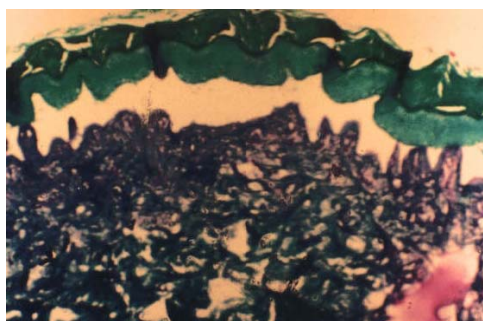


Figure 2 Subepidermal split, festooning of the dermal papillae, minimal inflammatory infiltrate in the dermis. PAS stain. 40x magnification

farm (**Table 1**). There was no history of similar blistering disorders in his siblings or other blood relatives.

There was no history of involvement of the mucous membranes, abdominal pain, weakness in the limbs, psychiatric illness, jaundice, alcohol intake, prior drug intake, blood transfusions, extra-marital sexual contact or any other constitutional symptoms.

On dermatological examination, the dorsa of both hands revealed small, tense vesicles, crusted lesions and multiple scars (**Figure 1**). Both shins, dorsa of feet and helices of the ears showed multiple hypo- and hyperpigmented scars. There was hypertrichosis of the temple and malar regions. The hair, nails and mucous membranes were not involved and a systemic examination revealed no abnormality.

An obtained urine specimen revealed a dark red color on macroscopic examination. On examination under Wood's lamp the specimen showed pink fluorescence.

Appropriate investigations were performed. A metabolic screen for porphyria revealed porphyrins in plasma, urine and stool. A skin specimen by biopsy was obtained from a blister site. Histopathology revealed subepidermal bullae, festooning of the dermal papillae, a minimal inflammatory infiltrate in the dermis (**Figure 2**) and periodic acid-Schiff-positive material around vessels in the papillary dermis.⁴ All these features were consistent with PCT.

A complete blood count, ESR, peripheral smear, serum ferritin, urea and electrolytes, creatinine, liver function tests, gamma glutamyl transpeptidase, hepatitis B surface antigen, anti-hepatitis C virus antibodies, anti-human immunodeficiency virus antibodies, ultrasonography of the abdomen, antinuclear factor, anti-double-stranded DNA and blood sugar were within normal limits.

On the basis of clinical picture, dark red urine, pink fluorescence of the urine on Wood's lamp examination, porphyrins in plasma, urine and stool and a consistent histological picture, a diagnosis of PCT was made.

The patient was recommended avoidance of precipitating factors. He was advised to thoroughly wash all fruits before consumption, avoid sunlight, alcohol and the c-p450 inducing drugs such as sulphonamides and macrolides. As maintenance treatment; he was prescribed low-dose chloroquine phosphate and

phlebotomy to maintain hemoglobin below 12g/dl.

These measures resulted in considerable improvement over the next one year.

Discussion

80% of all cases of PCT are triggered by alcohol and estrogens.⁵ Iron overload,^{5,6} hepatitis B and C virus infections,⁷ human immunodeficiency virus,⁸ lupus erythematosus - both systemic and discoid,⁹ and polycyclic halogenated hydrocarbons constitute the remaining triggers.^{2,3}

The most famous incident of an outbreak of PCT was the occurrence of 4000 cases between 1956 and 1961 in Turkey. It was due to the consumption of wheat contaminated with the fungicide, hexachlorobenzene.²

Our patient reported using D.D.T., Thiodan and Dithene M 45 at his farm (**Table 1**). The first two agents are organochlorines and the third organomanganese. Keeping in mind the above incident and our patient's personal history of fruit-farming; a visit was undertaken to the National Agricultural Research Council (NARC) at Islamabad. This visit revealed that most of the commonly used pesticides and some of the commonly used fungicides in our country are organochlorines and organophosphates. Organochlorines are hydrocarbons and chlorine and organophosphates are hydrocarbons and phosphates. Both groups are polycyclic hydrocarbons. A list of the commonly used pesticides and fungicides provided by the NARC is shown in **Table 1**.

Table 1 Commonly used pesticides and fungicides in Pakistan

| <i>Proprietary name</i> | <i>Chemical composition</i> |
|-----------------------------------|-----------------------------|
| <i>Commonly used pesticides</i> | |
| D.D.T. | Organochlorine |
| Thiodan | Organochlorine |
| Methyl-parathion | Organophosphate |
| Anthio | Organophosphate |
| Labycide | Organophosphate |
| <i>Commonly used fungistatics</i> | |
| Dithene M 45 | Organomanganese/zinc |
| Trimelton 40 | Copper oxychloride |

In our patient the clinical picture, laboratory abnormalities and histological picture was suggestive of PCT. It was most likely due to the consumption of fruits treated with polyhalogenated cyclic hydrocarbons which had been used as pesticides and fungicides.^{2,3}

Polycyclic halogenated hydrocarbons modify the physicochemical properties of hepatic uroporphyrinogen decarboxylase leading to a sharp decrease of its activity without affecting its antigenic reactivity.¹⁰ The response of the patient to interventional measures is commensurate with various studies indicating that porphyria cutanea tarda is not a protracted disease.¹¹

This chronic and debilitating disease could have been prevented by avoiding the offending agents. Alternative pesticides and fungicides should be employed. The government departments need to be informed in this regard and farmers educated. Awareness should be created amongst the general public to thoroughly wash all fruits before consumption.

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