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DDS-induced photosensitivity with reference to six case reports

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Summary Photosensitivity as an adverse reaction to DDS was recognized in 6 patients of our hospital during the summer of 1988. The clinical manifestations and also the management of those patients are given in detail. All doctors and health workers involved with leprosy need to be aware of such a problem and to take correct decisions after weighing the risk of photosensitivity against the potential benefit of DDS.

Introduction

Among all the side-effects of dapsone, drug-induced photosensitivity is a relatively rare phenomenon. DDS, a substrate competitive inhibitor of *p*-aminobenzoic acid in the folate metabolism is similar to sulphonamides in not only the mechanism of action, but also in causing a variety of skin manifestations as side-effects like chemical photosensitivity. In tropical countries like India where the intensity of ultraviolet radiation due to sunlight is relatively high, DDS-induced photosensitivity is likely to be observed more frequently.

Case Report 1

This female patient, aged 19, commenced a WHO paucibacillary regimen (DDS and rifampicin) on 7 February 1987.

On March 25 the patient came to the hospital with itching, diffuse desquamation and swelling of the extremities of 2 weeks duration. Clinically the patient had oedema and desquamation only on exposed areas: face, neck, both forearms and dorsum of both feet.

She was hospitalized and managed with prednisolone for a short period after discontinuing DDS. The swelling and desquamation then subsided. On 4 April the patient was given DDS 100 mg and observed for any skin reaction. As it was thought initially the skin lesions were due to hypersensitivity phenomenon, the patient was kept indoors while being tested with DDS. Despite that, the patient developed itching and papules over the extremities after 1 h. So DDS had to be discontinued permanently.

The patient came again with the same skin manifestations and swelling of the extremities on 16 April. She was then managed with prednisolone for 2 weeks. The lesions subsided and she was discharged. Later on there was no recurrence and clofazimine was given instead of DDS.

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Case Report 2

This male patient, aged 49, started a WHO multibacillary regimen (DDS, clofazimine and rifampicin) on 28 December 1987.

On 9 February 1988 the patient came to the mobile clinic with desquamation, papules and hyperpigmentation over upper extremities and fissures over the lips. The lesions were confined only to exposed areas.

The patient was admitted after 2 days and treated with a short course of prednisolone after having withdrawn DDS from the regimen. The skin lesions had then subsided. On 25 February the patient was given DDS 100 mg and checked for any skin reaction. As in the first case the patient was kept indoors. The patient had no itching or skin lesion, hence DDS was continued.

After 1 week the patient came with recurrence of the same skin lesions and itching present over both the forearms, face and lips. DDS was stopped and the patient was managed with systemic antihistamines and topical zinc oxide ointment as a sunscreen. Later on DDS was discontinued permanently and he was given INH instead.

Case Report 3

This female patient, aged 35, started a WHO multibacillary regimen (DDS, clofazimine and rifampicin) on 30 December 1987.

On 18 March 1988 the patient came to the hospital with itching and skin lesions. On examination the patient was found to have skin coloured papules and plaques over the extensor aspect of both forearms and erythematous papules over the nape of the neck. The patient was treated as an out-patient. DDS was stopped and the skin lesions were treated with systemic prednisolone. During that period of 3 weeks, the patient was advised to stay indoors and to apply *p*-aminobenzoic acid ointment during the daytime. After the skin lesions had subsided, she was given DDS 100 mg and exposed to sunlight for 2 hours. As the patient had no itching or skin lesion, DDS was continued. Since then the patient has had no problems with DDS.

Case Report 4

This female patient, aged 38, commenced a WHO multibacillary regimen (DDS, clofazimine and rifampicin) on 21 September 1987.

On 2 May 1988 the patient came to the mobile clinic with itching, diffuse desquamation and hyperkeratosis of the forearms and dorsum of both hands. Clinically the lesions were found only over exposed areas. DDS was then stopped and the patient was managed with topical application of zinc oxide ointment, systemic antihistamines and advised to stay indoors during the daytime.

On 17 May the patient was hospitalized as there was no relief with the above management. She was then treated with oral prednisolone and topical zinc oxide ointment. The lesions subsided after 2 weeks. She was then given DDS 100 mg and kept outdoors to expose herself to sunlight. Since there was no itching or any skin lesion after 2 h of exposure, the patient was advised to continue DDS. After 2 months, she again came with hyperkeratosis of the exposed areas of the dorsum of both feet and desquamation of the dorsum of both hands. As the skin lesions were mild when compared to the first episode, DDS was continued while reducing exposure to sunlight using topical zinc oxide ointment as a sunscreen. When she came to the next clinic she still had mild desquamation of the hands which was not troublesome to her.

Case Report 5

This female patient, age unknown, commenced treatment of a WHO multibacillary regimen (DDS, clofazimine and rifampicin) on 19 August 1987.

On 11 May 1988 the patient presented herself with itching and erythematous papules over the exposed areas, i.e. extensor aspect of both forearms, face, dorsum of both feet and abdomen, of 2 week's duration.

She was managed as an outpatient with oral prednisolone in combination with *p*-aminobenzoic acid topically as a sunscreen during the daytime. The lesions disappeared. On 1 June 1988 the patient was given DDS 100 mg and observed for photosensitivity. The patient had no itching or skin lesions after an hour of exposure. DDS was then continued.

On 29 June the patient came again to the clinic with the recurrence of the same skin lesions over the extensor aspect of both forearms and face. DDS was again stopped and the skin lesions were treated with topical zinc oxide and systemic antihistamine. Afterwards, DDS was withdrawn from the regimen while clofazimine and rifampicin were continued.

Case Report 6

This female patient aged 37 commenced a WHO multibacillary regimen (DDS, clofazimine and rifampicin) on 11 May 1988.

On 8 July 1988 the patient presented herself with the complaints of papules of one week's duration on both forearms, neck, abdomen, face and both legs. On examination the papules were erythematous and seen only over the exposed areas extending slightly beneath the blouse.

DDS was stopped while clofazimine and rifampicin were continued. The patient was treated with antihistamines systemically and zinc oxide ointment topically with the advice to keep indoors. The skin lesions and itching had subsided after 1 week. She was then tested for photosensitivity with DDS 100 mg in combination with sunlight. As the patient developed no skin lesions after an hour of exposure, DDS was continued.

But the patient came again with the recurrence of the same skin lesions the very next week. Actually the lesions had started the same evening on the day of restarting DDS. DDS was then stopped permanently and the photosensitivity was managed with zinc oxide ointment as a sunscreen and systemic antihistamines. She had no problem when she came for the next clinic and ethionamide was given instead of DDS.

Discussion

Photosensitivity reactions can be broadly classified into phototoxic and photoallergic. The former depends upon the intensity of ultraviolet radiation and the concentration of the offending agent and is independent of the immune system. The latter involves the cell-mediated immune system and is independent of the intensity of ultraviolet radiation. Clinically the phototoxic reactions are the exaggeration of sunburn, i.e. erythema, swelling and even bullae. Hyperpigmentation and desquamation can also occur. Photoallergic reactions consist of erythematous eruptions, discrete papules and plaques.

In the first case report, though initially the patient had phototoxic reaction, later on when tested with DDS, she also developed photoallergic reaction, i.e. multiple papules. She also came with a recurrence of the same type of skin lesions after 10 days. Though the long half-life of the DDS due to enterohepatic circulation may account for this event even after stopping the drug, the concentration may not be adequate to induce 'phototoxic' photosensitivity.

The photosensitivity is mainly phototoxic in the second case report as hyperpigmentation and desquamation were the main manifestations. The presence of a few papules may also indicate the involvement of a photoallergic mechanism. Likewise case reports 3, 5 and 6 also had both phototoxic and photoallergic reactions. The fourth case report reveals the presence of a phototoxic reaction only.

It is obvious from the case reports that the photosensitivity occurred during the months of April, May and June which are supposed to be the hottest months in India, i.e. when the intensity of ultraviolet radiation is high. In all the case reports, the photosensitivity was recurrent and most of them needed systemic corticosteroid therapy.

Regarding the management aspects, mild photosensitivity may respond to the withdrawal of DDS, topical sunscreen and systemic antihistamines. Systemic corticosteroid is needed if the reaction is severe. In the first two case reports the patients were not kept outdoors as it was thought that all skin reactions were due to hypersensitivity. The question of continuation or withdrawal of DDS after one episode of photosensitivity is difficult to answer. As DDS is a potent antileprotic drug and the photosensitivity reactions are less harmful when compared to the other allergic skin manifestations of sulphones, DDS can be continued. If the patient develops severe skin reaction during testing with DDS, the same drug can be stopped temporarily with the intention of continuing after the summer period. In the case of a patient also developing recurrent severe skin reaction during the winter, DDS should be stopped permanently.

If the recurrent reactions are mild, DDS may be continued with the advice to keep indoors and/or use sunscreens topically during the daytime. Other physical measures such as wearing long-sleeved shirts or blouses and using an umbrella during the daytime to minimize exposure to sunlight can also be valuable adjuvants in the management of mild photosensitivity.

References

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