



## Acute Onset Pellagra Secondary to Isoniazid Therapy

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### Abstract

*Isoniazid (INH) commonly causes pyridoxine deficiency. It can also cause niacin deficiency leading to pellagra, diagnosis of which is often delayed or missed. We report one such case of INH induced pellagra.*

*A 35 year old male patient with pulmonary tuberculosis on anti-tubercular therapy for 2 months containing isoniazid, rifampicin, pyrazinamide and ethambutol, presented with 2 weeks history of diarrhoea and rashes over his neck and all four limbs. Upon examination, he had hyperpigmented, hyperkeratotic symmetric plaques over the neck, dorsal surface of the feet, extensor surface of hands and forearms. Skin biopsy findings were consistent with Pellagra. Niacin 200mg/day for 2 weeks showed significant improvement in his condition.*

*Pellagra is a chronic systemic disease caused by deficiency of niacin, features of which are classically described as four D's, diarrhoea, dermatitis, dementia and death. Dietary deficiency of tryptophan, chronic alcohol consumption, abnormalities of tryptophan metabolism and drug induced are the common causes of niacin deficiency. INH, being a structural analogue of niacin, suppresses endogenous niacin production especially in slow acetylators, thereby causes niacin deficiency. Simple oral supplementation of niacin is sufficient to improve the condition.*

**Keywords:** Pellagra; Isoniazid; Tuberculosis; Niacin; Anti-tubercular therapy.

### Introduction

Pellagra is a chronic multisystem disease caused due to the deficiency of niacin (vitamin B3). Rarely, it has an acute onset and the dermatitis resembles a sunburn. Isoniazid (INH) commonly causes pyridoxine deficiency. It can also cause niacin deficiency, diagnosis of which is often delayed or missed.

### Case Report

A 35 year old male patient, a case of sputum positive pulmonary tuberculosis, with no co-morbidities, on anti-tubercular therapy for 2 months containing isoniazid, rifampicin, pyrazinamide and ethambutol, presented with 2 weeks history of watery diarrhoea and rashes over his neck and all four limbs. Upon examination, his

vital signs were normal. He had hyperpigmented, hyperkeratotic symmetric well-demarcated plaques over the neck (Figure 1), dorsal surface of the feet (Figure 2), extensor surface of hands and forearms (Figure 3). Systemic examination including thorough neuropsychiatric evaluation was normal. Basic laboratory investigations were normal. No infectious cause of diarrhoea could be detected. Skin biopsy from the lesion showed hyperkeratosis and acanthosis of epidermis with dermal inflammatory infiltrates which was consistent with pellagra. Patient was given niacin 200mg/day for 2 weeks which showed significant improvement in his condition.

**Figure 1:** Hyperpigmented lesions over the neck



**Figure 2:** Hyperpigmented hyperkeratotic scaly lesions over the dorsal surface of feet



**Figure 3:** Hyperpigmented, hyperkeratotic scaly lesions over the dorsum of the hands and forearms



### Discussion

Pellagra is a chronic systemic disease caused by deficiency of niacin, features of which are classically described as four D's, diarrhoea, dermatitis, dementia and death<sup>[1]</sup>. Untreated patients die in 4-5 years. Dietary deficiency of tryptophan, chronic alcohol consumption, abnormalities of tryptophan metabolism and drug induced are the common causes of niacin deficiency<sup>[2]</sup>. INH, being a structural analogue of niacin, suppresses endogenous niacin production especially in slow acetylators, thereby causes niacin deficiency<sup>[3]</sup>. INH is metabolized by arylamine N-acetyltransferase. Individuals with a less active form of this enzyme are vulnerable to have pellagra<sup>[4]</sup>.

Clinically pellagra has three cardinal features: dermatitis, diarrhoea and dementia. However many patients do not manifest with all the features. Dermatitis is usually the first manifestation. The usual appearance is a sunburn-like erythema or a hyper-pigmented desquamated rash characteristically on the sun-exposed areas. Rash is of tenbilateral, symmetrical and sharply demarcated, usually seen over the dorsum of

hands and forearms, front of the neck, face and sun-exposed skin areas on legs and feet<sup>[5]</sup>.

Diagnosis of pellagra is mainly clinical. Conditions which mimic pellagra are drug eruptions, discoid lupus erythematosus, photodermatitis, atopic dermatitis, polymorphous light eruption, pemphigus vulgaris and porphyria cutaneatarda<sup>[1]</sup>. Definitive diagnosis is by biopsy and histopathological examination which shows hyperkeratosis and acanthosis of epidermis with vacuolar degeneration of the keratinocytes and chronic inflammatory infiltrates in the dermis<sup>[6]</sup>.

Simple oral supplementation of niacin is sufficient to improve the condition. In literature very few cases of INH induced pellagra have been reported<sup>[2,4,6]</sup>, hence we report one such case. Although more emphasis is given to pyridoxine deficiency in patients on INH, it is equally important to recognize the features of niacin deficiency and treat at the earliest.

#### **Conflict of Interest**

Dr. Swasthik Upadhya P. and Dr. K. Sriharsha declare that they have no conflict of interest.

#### **Compliance with Ethical Standards**

Informed consent has been taken from the patient.

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