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A 29-Year-Old Woman from Malawi With Confusion, Diarrhoea and a Skin Rash

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Clinical Presentation

History

A 29-year-old woman is brought to a hospital in Malawi by her relatives. She has been confused, restless and irritable for the past month. She also has watery diarrhoea, which started 1 week ago. She does not have a fever. It is January, which is the rainy season in Malawi.

Her past medical history has been uneventful. There have been no psychiatric disorders in the past. Her HIV status is unknown. She is not taking any medication. There are no known intoxications, no use of alcohol or recreational drugs.

The patient is married with four children. She is a housewife. Her husband works as a farmhand on a local chicken farm. They live in a grass-thatched mud-hut and collect their water from a borehole. There is no electricity at home. They eat two meals a day, mainly maize porridge with a few vegetables. Only rarely can the family afford fish or meat.

Clinical Findings

The patient is slim but not wasted. Glasgow Coma Scale 14/15 (confusion), the remaining vital signs are normal and she is afebrile. There is no neck stiffness. The conjunctivae are pale. There is a noticeable skin rash around the patient's neck (Fig. 37.1), on her forearms, hands and feet (Fig. 37.2), where the skin appears hyperpigmented and dry. The skin changes are clearly demarcated. The rest of the physical examination is unremarkable. When asked, her relatives report that the rash had been present for the past 2 months.

Questions

1. What is the suspected diagnosis and what are your differential diagnoses?
2. How would you manage this patient?



• Fig. 37.1 Hyperpigmented skin rash on sun-exposed skin.



• Fig. 37.2 The skin changes involve both hands and feet. The skin appears dry and scaly.

Discussion

A young Malawian woman presents during the rainy season with a 1-month history of confusion, acute watery diarrhoea and a rash that mainly seems to affect the sun-exposed areas of the skin. The family appear to be poor villagers; they live on an imbalanced diet.

Answer to Question 1

What is the Suspected Diagnosis and What Are Your Differential Diagnoses?

The patient presents with a triad of neuropsychiatric changes, watery diarrhoea and a photosensitive dermatitis. This clinical triad – diarrhoea, dermatitis, dementia – is typical of pellagra (vitamin B₃ deficiency). The rainy season, during which the patient presents, is not only the peak of malaria transmission but is also the ‘hungry season’. Stocks have been consumed, the new crop is not ready for harvesting yet and in poor, rural areas large parts of the population go hungry.

A combination of confusion, diarrhoea and skin changes in a sub-Saharan African setting should also prompt any clinician to rule out HIV infection. Persistent confusion in the context of HIV is commonly seen in tuberculous meningitis, cryptococcal meningitis and progressive multifocal leukoencephalopathy (PML), or may be caused by the human immunodeficiency virus (HIV-associated neurocognitive disorder). Both diarrhoea and skin changes of various aetiologies commonly occur in HIV infection.

A further differential diagnosis to consider in a patient with photosensitive dermatitis, anaemia and neuropsychiatric changes is systemic lupus erythematosus.

Answer to Question 2

How Would You Manage This Patient?

Even though the clinical presentation is very typical of pellagra, other differential diagnoses should actively be ruled out: A diagnostic HIV test should be carried out. The fact that the patient is currently unable to receive counselling and give her consent should not lead to a delay of testing because its result determines immediate further management. Once confusion has settled, the HIV test should be repeated to include a pre- and post-counselling session. In case of a reactive HIV serology, a lumbar puncture should be done to rule out tuberculous or cryptococcal meningitis.

A full blood count would help assess the cause of the patient’s clinical anaemia. If normocytic anaemia is found, creatinine should be checked, because chronic kidney disease is very commonly seen in the tropics. Patients often present late, and both confusion and dermatitis can be signs of uraemia.

In case of a microcytic, hypochromic anaemia patients should be treated with iron and possibly also receive folic acid substitution, because a poor diet usually is not limited to just one nutritional component. β -thalassaemia, commonly seen in tropical countries, also presents with microcytic anaemia and should be considered if there is no response to iron

supplementation. In β -thalassaemia the so-called Mentzer index (MCV [fL] : Erythrocyte count [$\times 10^{12}/L$]) is typically below 13; in iron deficiency it is above 13.

Intestinal helminth infection can contribute to anaemia. Because reliable stool microscopy may not be feasible in a resource-constrained setting, pragmatic anthelmintic treatment appears justifiable. Vitamin B₃ (niacin) should be supplemented and it should be evaluated how the family’s diet could be improved despite their poor socioeconomic circumstances. A simple affordable trick is to advise the patient to eat some of the maize directly from the cob, because it is the husks that harbour tryptophan and that go lost during preparation of white maize flour.

It is a slight irony in this case that the husband is working on a local chicken farm and still cannot afford a balanced diet that includes eggs and poultry for his family.

The Case Continued...

The HIV test came back negative. The full blood count showed a microcytic anaemia with a haemoglobin of 6.7 g/dL and a Mentzer index >13 . The patient received an appropriate dose of vitamin B-complex, iron and folic acid supplementation and a single dose of albendazole. Her confusion settled within a week and the diarrhoea stopped. The patient and her family received dietary counselling. She was prescribed soothing applications for her skin lesions and was told to avoid sun exposure. She was discharged and asked to come back at 3 months for an outpatient follow-up visit including a repeat full blood count.

SUMMARY BOX

Pellagra

Pellagra is a nutritional disorder caused by the deficiency of vitamin B₃ or its precursor, the essential amino-acid tryptophan. ‘Pellagra’ is derived from the Italian *pelle agra*, meaning ‘rough skin’. It continues to be a problem in central and southern Africa where maize is the main staple food. Maize is poor in tryptophan, which is required for niacin synthesis. In some parts of Africa white maize is mainly consumed, which is nutritionally poorer than the yellow maize used in this region as animal feed. Milling maize and removing its husks further deprives it of nutritious components. In many poor African countries with little crop diversity, diet may literally consist of just maize, whereas niacin-containing food items such as fresh fruits, vegetables, peanuts, fish, meat, milk and eggs are not affordable. Most nutritional disorders peak during the rainy season, including kwashiorkor and marasmus in children. Apart from a poor diet, pellagra may be caused by malabsorption, alcoholism, antituberculous treatment and other aetiologies. The roll-out of INH-preventive therapy (IPT) for HIV patients has led to an increase in pellagra cases in some areas in Africa. Single cases of pellagra continue to be described from all over the world.

Patients present with the three ‘Ds’ of dermatitis, diarrhoea and dementia. The dermatitis often presents in a typical shape around the neck, which is referred to as ‘Casal’s necklace’ after the Spanish physician who first described it in poor peasants in the 18th century. The skin tends to be dry, tender to touch and exposure to sunlight may be very painful.

'Dementia' stands for a large spectrum of possible neuro-psychiatric symptoms including anxiety, depression, hallucinations, ataxia and spastic paraparesis. A fourth 'D', death, occurs if pellagra is left untreated. The diagnosis is made clinically.

Treatment is with niacin or nicotinamide. Recommended doses in adults range from 50 to 400 mg daily in the acute phase. In severe cases, doses of up to 1000 mg IV per day have been recommended. Once acute symptoms have settled, continuation treatment is with 50 to 150 mg niacin daily for 2 weeks. Therapy should also include other B vitamins, zinc, magnesium and a diet rich in calories. Skin lesions should be covered with soothing applications and the patient should avoid sun exposure until the lesions have resolved. Patients and their families require intense dietary counselling on how to improve their diet despite socio-economic challenges.

Further Reading

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