



CASE REPORT



Pellagra and alcoholism: case report

Pelagra e alcoolismo: relato de caso

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ABSTRACT

Pellagra is a disease caused mainly by a niacin deficiency or its precursor amino acid, tryptophan. We report a case of a male patient, 34 years-old, a chronic alcoholic with *delirium tremens* and gastrointestinal symptoms (diarrhea, inappetence, and heartburn). He presented erythematous-brown, scaly, and well-defined plaques dispersed throughout the integument (photoexposed areas) for 2 months that evolved with ulceration and hematic crusts. The case was diagnosed as pellagra associated with secondary bacterial infection and treated with rest, free diet, B-complex replacement, abstention from alcohol, restriction of sun exposure, and broad-spectrum antibiotic therapy. The treatment allowed significant improvement of symptoms in one week. Aspects of the pathophysiology and differential diagnoses of this condition are discussed, reinforcing the importance of considering pellagra in the diagnostic hypothesis of patients with skin lesions associated with risk factors for malnutrition.

PALAVRAS-CHAVE

Alcoolismo
 Demência
 Dermatite
 Diarreia
 Pelagra

RESUMO

Pelagra é uma doença provocada, principalmente, pela deficiência de niacina ou do seu aminoácido precursor, triptofano. Relata-se um caso de um paciente do sexo masculino, 34 anos, alcoólatra crônico com *delirium tremens* e sintomas gastrointestinais (diarreia, inapetência e queimação). Apresentava placas eritemato-acastanhadas, descamativas e bem delimitadas dispersas pelo tegumento (áreas fotoexpostas) há 2 meses que evoluíram com ulceração e crostas hemáticas. O caso foi diagnosticado como pelagra associada a infecção bacteriana secundária e tratado com repouso, dieta livre, reposição do complexo B, abstenção do álcool, restrição da exposição solar e terapia antibiótica de amplo espectro. O tratamento realizado permitiu melhora significativa dos sintomas em uma semana. Aspectos da fisiopatologia e diagnósticos diferenciais dessa condição são discutidos, reforçando a importância de cogitar pelagra na hipótese diagnóstica de pacientes com lesões dermatológicas associadas a fatores de risco para desnutrição.

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INTRODUCTION

Pellagra was first described in 1735 by Gaspar Casal and termed in Italian *pelle agra*, which is sharp or rough skin, by Francesco Frapoli in 1771. In 1945, Krehl established that the disease occurs mainly due to dietary niacin deficiency, also called nicotinic acid and vitamin B3, or its precursor amino acid, tryptophan¹⁻⁴. This avitaminosis may be associated with a corn-based diet, as niacin is not bioavailable in this vegetable²⁻⁵. This deficit can also occur due to changes in metabolism, such as nervous anorectic, chronic alcoholism, prolonged diarrhea, colitis, cirrhosis, carcinoid syndrome, and drug induction^{1,6,7}.

Nicotinic acid is an active part of two coenzymes, nicotinamide adenine dinucleotide (NAD) and nicotinamide adenine dinucleotide phosphate (NADPH), which play a central function in hydrogen transport in cytological respiration. Therefore, when there is a deficiency of nicotinic acid and tryptophan, tissues with high energy expenditure, such as the central nervous system, and high cell turnover, such as the cutaneous and gastrointestinal tissues, are all affected^{3,6}.

This avitaminosis brings characteristic symptoms known as the three "Ds": dermatitis, diarrhea, and a neurological condition similar to dementia. The initial manifestations are dermatological lesions, whereas digestive and neurological lesions usually appear late and are not very specific. Cutaneous lesions can be papular and erythematous, accompanied by pruritus in photo-exposed regions. After a few days, other elementary lesions appear, such as blisters and ecchymoses, which evolve with atrophy and hyperpigmentation of the skin¹⁻⁷. Cutaneous pathognomonic forms appear in different locations: arms in "Casal's gloves", neck in "Casal's necklace", and legs in "Casal's boots"^{1,3,5}. The intensity of clinical presentations varies from exclusively dermatological cases to intense involvement of the nervous system, with evolution to the fourth D, death^{2,7}.

This disease is widespread among people with malnutrition, usually due to the pathophysiological changes of chronic alcoholism. Despite this risk factor being presented in the literature, few studies discuss niacin deficiency encephalopathy^{2,7-9}. This may be due to the simultaneous presence of other neurological conditions that make a differential diagnosis in alcoholic patients, such as *delirium tremens* and Wernicke-Korsakoff syndrome. Another explanation would be the manifestation of more specific dermatological to the detriment of neurological symptoms and the predominance of incomplete conditions, causing the underreporting of encephalopathies^{1,2,10,11}.

This study reports a case of pellagra in a chronic alcoholic patient in the North region of Brazil, emphasizing the clinical characteristics and the multi-professional treatment adopted. This work contributes to the study of pellagra. It is assumed that this condition is underdiagnosed and underreported, even with simple diagnosis and treatment, which could be

performed in primary healthcare services. Also, contributes to avoiding possible positive feedback to the maintenance of chronic alcoholism since niacin is a precursor of serotonin, which, in deficit, causes symptoms such as depression and anxiety^{1,2,7}.

CASE REPORT

Male, 34 years old, had daily alcohol consumption (about "one liter of brandy") since 14. He was treated at the General Hospital of Palmas because of delirium tremens. A dermatological evaluation was requested due to skin lesions over the entire body, which appeared about 2 months before and worsened after prolonged sun exposure. A sudden episode of psychosis occurred, in which the patient evaded from home without the knowledge of family members and was found with signs of heatstroke in an uninhabited region. He also had gastrointestinal symptoms, such as diarrhea, lack of appetite, and heartburn.

When he arrived at the hospital, his general condition was regular, stuporous, eupneic, stable, afebrile, pale, acyanotic, and anicteric. Brownish-erythematous, scaly, polycyclic plaques were identified on the upper back and limbs - photo-exposed areas (Figures 1 and 2). On the right upper limb, there was an ulceration covered by a hematic crust (Figure 3). The cervical region presented a "Casal's necklace" (Figure 4). The mucous membranes were preserved, and the lips had light desquamation.

The multidisciplinary approach included dermatology, psychiatry, psychology, internal medicine, nursing, nutrition, and social assistance. Treatment began immediately upon admission with intravenous hydration, broad-spectrum antibiotics, thromboprophylaxis, antipsychotics, and anxiolytics. The dermatology department diagnosed the case as pellagra associated with a secondary bacterial infection. He was prescribed vitamin B complex replacement, antihistamines, general care for skin lesions with topical antibiotics, and suspension of alcohol intake.

After this multidisciplinary approach, the patient showed a significant improvement in symptoms and was discharged within a week.

DISCUSSION

According to Rivitti¹, the diagnosis of pellagra is eminently clinical, requiring no laboratory work. In this case, this was performed during a dermatological evaluation through anamnesis and physical examination. The types and sites of skin lesions and the gastrointestinal and psychiatric symptoms led to the diagnostic suspicion of pellagra, including the characteristic presentation of the three "Ds" (dermatitis, diarrhea, and dementia). This situation is well described in the literature by Braverman¹² and Noleto et al.¹³.



Figure 1 – The back and upper limbs were erythematous-brown, scaly patches with a polymorphous configuration.



Figure 3 – Right arm: ulceration covered by hematic crust and mild edema.



Figure 2 – Lower limbs: presence of erosions and hematic crusts.



Figure 4 – Neck: "Casal's necklace".

"Casal's necklace" dermatitis (Figure 4), resulting from intense sun exposure, was present, a clinical finding described by Prabhu et al.³ as a classic sign of the disease. The cutaneous photosensitivity present in

people with pellagra is still not well understood, considering as essential components the excessive production of kynurenic acid, a photosensitizer, and the scarcity of urocanic acid, which protects the skin from the harmful effects of ultraviolet B radiation¹⁻³.

Ng and Neff⁹ stated that the treatment of this avitaminosis is simple when correctly identified and consists of rest, an unrestricted diet, abstaining from alcohol, and avoiding sun exposure^{1,6,10}. However, due to the severity of the condition, it was necessary to add niacin replacement through a vitamin complex, and broad-spectrum antibiotic therapy, because of the secondary bacterial infection. According to Rivviti¹, vitamin supplementation alone does not cure patients in more severe cases, who may progress to the fourth D - death - if they do not receive life support therapy.

According to research carried out by Piqué-Duran

et al.⁷ and Murga et al.¹⁴, malnutrition resulting from chronic alcoholism is the leading risk factor for developing pellagra, reflected in this report as a trigger for the disease. Thus, health promotion through the suspension of alcohol intake is the best practice to avoid new cases of this avitaminosis. Chronic alcoholism presents complex somatic, mental, and social changes^{2,10,11}, and this causes the need for continuous multi-professional treatment.

Due to a more balanced diet with micronutrients, incomplete presentations of pellagra with exclusively cutaneous manifestations are more prevalent in the literature^{5,6,10}. Reports like this, with a complete clinical presentation of the disease, in which the three Ds are diagnosed, are less frequent. However, this lower incidence cannot justify the scarce literature on the neurological aspects of the disease. Therefore, it is assumed that there is underdiagnosis or misdiagnosis due to other syndromes that affect patients with chronic and excessive alcohol consumption^{1,5,6}.

The neurological alterations of pellagra are important, although not very specific, making the differential diagnosis problematic. Niacin is a precursor of the myelin sheath and serotonin, which in deficit cause symptoms such as mental disorders, agitation, peripheral neuritis, myelitis, anxiety, and

depression^{2,5,6}. The patient in question had advanced neurological symptoms, but, as described by Lopez et al.⁵, the contribution of treatment with B-complex replacement could not be well represented in this specific case because the neurological symptoms were alleviated by the administration of antipsychotics and anxiolytics.

CONCLUSION

This report presents a typical case of pellagra. This disease is underdiagnosed in Brazil and underreported due to social neglect since its highest incidence in the West occurs in marginalized groups, such as chronic alcoholics. Despite the simple diagnosis and treatment, it is still necessary to intensify efforts to develop research that produces more evidence on the subject, including demonstrating with data the economic and social problems present in the life history of diagnosed people. This concern is even more urgent because pellagra has high morbidity and mortality when not correctly diagnosed and treated. Clinical knowledge of the disease, multi-professional involvement, and careful evaluation can be of great effectiveness in the clinic and the favorable prognosis of the patient.

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