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CASE REPORT/CASO CLÍNICO

Thiamine: A Case Report on Wernicke Syndrome and Anorexia Nervosa
Tiamina: Caso Clínico sobre Síndrome de Wernicke e Anorexia Nervosa

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Resumo

A anorexia nervosa (AN) é uma perturbação do comportamento alimentar grave. Embora a encefalopatia de Wernicke (EW) surja frequentemente em associação à perturbação de uso do álcool, casos de EW foram descritas na AN associados a desnutrição e síndrome de realimentação. O objetivo deste trabalho é apresentar o caso clínico de uma mulher de 27 anos, com diagnostico de AN e internada por baixo peso de 33 kg e índice de massa corporal de 12,9 kg/m^2, que desenvolveu EW. Foi introduzido plano alimentar e após duas semanas, apresentou quadro de início súbito de lentificação psicomotora, comportamento desorganizado, enurese noturna e necessidade de apoio na alimentação. Destaca-se ainda défice na atenção e memória, com confabulação. Pela hipótese diagnóstica de encefalopatia metabólica, foi iniciado tratamento com tiamina, observando-se melhoria clínica. A AN comporta um risco letal, associado a défices nutricionais e complicações médicas graves, exigindo vigilância, avaliação cuidadosa e intervenção precoce.

Abstract

Anorexia nervosa (AN) is a severe eating disorder. Although Wernicke's encephalopathy (WE) is frequently associated with alcohol abuse, non-alcoholic WE has been described in AN associated with malnutrition and refeeding syndrome. This work aims to present a case report of non-alcoholic WE associated with AN. A 27-year-old woman diagnosed with AN was admitted to the hospital for a low weight of 33 kg and body mass index of 12.9 kg/m^2. The patient started a nutritional plan, and two weeks after, she presented a sudden onset of psychomotor slowing, disorganized behaviour, nocturnal enuresis and the need for feeding support. On evaluation, she also had a defect in attention and memory with confabulation. Due to the diagnostic hypothesis of metabolic encephalopathy, the patient started thiamine with progressive clinical improvement.

AN carries a lethal risk associated with severe nutritional deficits and medical complications, so careful surveillance, assessment and early intervention are required.

Palavras-chave: Anorexia Nervosa/complicações; Deficiência de Tiamina/ complicações; Encefalopatia de Wernicke/ etiologia

Keywords: Anorexia Nervosa/complications; Thiamine Deficiency/complications; Wernicke Encephalopathy/etiology

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INTRODUCTION

Anorexia nervosa (AN) is a severe eating disorder characterized by the restriction of caloric intake leading to a significantly low body weight, associated with fear and concern about weight and disturbed body/self-perception.[1] The lifetime prevalence is estimated to be between 0.9% to 4% in women, with lower rates in men.[2] The consequences of nutritional deprivation in anorexia nervosa carry substantial health risks, with considerable morbidity and mortality, such as cardiovascular arrhythmia.[1] Therefore, the monitoring of these patients must be multidisciplinary, based on the assessment of immediate medical complications.[1]

Nutritional replacement is the treatment of choice, which must be carried out very slowly due to the risk of refeeding syndrome.[1] The refeeding syndrome is a metabolic condition secondary to fluid and electrolyte changes, causing hypophosphatemia, hypokalaemia, hypomagnesemia, and hypovitaminosis.[3] It can result from increased nutritional intake (oral, enteral, or parenteral) during nutritional deprivation and can cause severe cardiac and neurologic complications.[3,4]

The literature describes anorexia nervosa, malnutrition, and refeeding syndromes as a possible basis for Wernicke's encephalopathy (WE).[5]

Wernicke's encephalopathy is an acute neuropsychiatric syndrome resultant from thiamine deficiency, commonly associated with alcoholism. The classic triad symptoms englobe the acute onset of ocular abnormalities, ataxia and global confusional states.[5]

Although, WE is mainly associated with alcoholism, other less obvious medical conditions are possible causes, such as: prolonged intravenous feeding, hyperemesis gravidarum, thyrotoxicosis, malabsorption syndromes, haemodialysis, peritoneal dialysis, acquired immunodeficiency syndrome (AIDS), malignancy and gastroplasty with postoperative vomiting.[5]

Therefore, to diagnose a non-alcoholic Wernicke's encephalopathy triggered by other conditions, a high level of suspiciousness is necessary, since the classic triad symptoms are only present in 16% of the patients, consequently non-alcoholic Wernicke's encephalopathy is often underdiagnosed.[5]

Wernicke's encephalopathy carries a high mortality risk. Hence, early intervention and immediate treatment with thiamine replacement is crucial to fully re-establish patients' health and minimize the development of WE to a more progressive, irreversible, and non-treatable syndrome such as Korsakoff syndrome, characterized by mnesic changes and confabulation.[6]

The authors pretend to illustrate a rare case report of a 27-year-old diagnosed with anorexia nervosa and Wernicke encephalopathy.

CASE REPORT

We report a 27-year-old woman diagnosed with purgative AN. The patient has been followed at the specialized unit for eating disorders of the Centro Hospitalar Universitário de Lisboa-Norte, since the age of 15, with multiple previous admissions at the inpatient unit. She was also diagnosed with depressive disorder not otherwise specified and treated with clomipramine 75 mg, olanzapine 7.5 mg and trazodone 150 mg. The patient denied a history of drug or alcohol abuse, drug allergies, and prior neurological disease. Furthermore, the patient denied relevant family history.

The patient was admitted to the specialized unit for eating disorders after a very low body weight of 33 kg with a body mass index (BMI) of 12.9 kg/m^2. Physical examination revealed thin skin, fine hair and various tooth loss, with regular cardiovascular status and temperature. Her mental status examination demonstrated a depressed mood and insomnia. Mini-mental state examinations (MMSE) was 30 out of 30. Initial laboratory analysis was standard (average phosphate level) as well as the electrocardiogram (ECG). The patient started a very slowly nutritional replacement and optimization of the psychopharmacological treatment.

After two weeks, the patient developed perplexity, psychomotor retardation, disorganized behaviour, attention and memory deficit with confabulatory speech, and dependence for daily activities, namely eating and hygiene, not previously observed. Blood and urine tests were repeated and were between the normal range, including vitamins, electrolyte and hormones measurements. Brain computerized tomography (CT) and magnetic resonance imaging (MRI) showed global atrophy of global cortical cerebrospinal fluid spaces, particularly on the left Sylvian fissure and the fronto-anterior and frontoparietal regions (Fig. 1). Other likely clinical causes of confusional state were ruled out. Even though imaging results were more consistent of long-standing restrictive dietary intake, to tackle the suspicion of metabolic encephalopathy as a consequence of thiamine deficiency, intravenous thiamine was administrated. Initially 500 mg, three times a day for three days, followed by 250 mg, three times a day for five days, and 100 mg oral, three times a day. Also, multivitamins, folic acid and magnesium were implemented.

Clinical status improved after one week, but the patient showed periods of disorientation to time and some difficulty with object recall and repetition. Global clinical status improved at discharge with substantial weight gain - 41.1 kg with BMI 16.1 kg/m^2. The Montreal Cognitive Assessment (MoCA) test revealed a 28/30, with difficulty evocation at discharge. Daily oral thiamine replacement was continued in outpatient follow-up.

DISCUSSION

Thiamine is a water-soluble vitamin, found primarily in metabolically active tissues, like the brain and glia. It is essential for carbohydrate metabolism and energy source in lipidic metabolism. It is, also fundamental, for myeline sheath production at the neuronal cell and its maintenance. Thiamine plays a role in the production of amino acids, neurotransmitters synaptic transmission (such as acetylcholine and GABA) and neuronal conduction. Therefore, neurological dysfunction may result from thiamine deficit.[3,7] Magnesium is a cofactor for thiamine-dependent enzymes, functioning as catalytic action of various enzymes, thus essential in thiamine activity.[6]

The daily intake need of thiamine in women is 1.1 mg and body reserves in a healthy individual are between 25-30 mg, sufficient for a maximum of 18 days. Hence, any condition that leads to an unbalanced nutritional intake that extends 2-3 weeks may lead to thiamine deficit.[8]

As mentioned, WE can occur in AN, primarily associated with nutritional deficits and refeeding syndrome.

Refeeding syndrome can occur once nutritional intake increases, consequently, originating metabolic and hydroelectrolytic alterations due to ion movement into the intracellular space or plasma volume.[4] In this syndrome, the carbohydrate ingestion stimulates insulin secretion and switches it from a catabolic state to an anabolic state, where thiamine is needed.[8] So, despite the gradual onset of nutritional intake, the increase in carbohydrates can condition the increase in thiamine requirements, aggravating thiamine deficit.[6]

Therefore, chronic decrease in food intake and AN which are already associated with low underlying thiamine reserves, are at a higher risk to develop thiamine deficit.

In the literature, AN associated with a BMI of less than 16 kg/m^2 carries a high risk of refeeding problems.[8] In this case, the patient presented a BMI of 12.9 kg/m^2.[4]

Other risk factors for refeeding syndrome are unintentional weight loss greater than 15%, within the last 3-6 months, little or no nutritional intake for more than 10 days and low levels of potassium, phosphate, or magnesium prior to feeding. Similarly, a history of alcohol abuse or drugs including insulin, chemotherapy, antacids, or diuretics.[4]

Our patient did not present with the complete classical triad in WE and the complementary studies excluded other etiological causes. Nevertheless, the clinical manifestation of acute confusion, in the absence of hydroelectrolytic alterations, as well as other changes in the diagnostic exams and a higher risk of refeeding syndrome led to a high suspicion of WE, consequently thiamine was implemented as empirical treatment.

In the literature, in 45% of cases of AN, some neurological complications are present.[9] Also, some studies show that the prevalence of thiamine deficit in AN is 38%, with 19% of patients fulfilling stringent deficiency criteria.[10]

Therefore, WE is a clinical diagnosis and although a rare complication of AN.[11] While there are no specific laboratory or imagological tests for the diagnosis of WE, a brain MRI may be helpful if WE is suspected, as it is a reliable exam and can support the diagnosis.[5,7]

Brain MRI imaging studies in non-alcoholic WE patients show bilateral and symmetrical changes in the mammillary bodies and periventricular encephalic regions (medial thalamus, periaqueductal region, and fourth ventricle floor). Sensitivity is 53% and specificity 93%, with a positive predictive value of 89%.[4,5,7,12] The absence of typical lesions does not exclude the diagnosis, but their presence is highly suggestive.[4,13]

In the case reported, the brain MRI did not show typical lesions and the diagnostic confirmation was supported by clinical improvement, after parenteral thiamine administration and total disappearance of symptomatology with the continuity of treatment.

There are no specific guidelines concerning AN and WE in the literature, mainly the dose and frequency of thiamine replacement. However, The European Federation of Neurological Societies and the Royal College of Physicians recommend early treatment with parental thiamine in high doses for the Wernicke's encephalopathy, since oral absorption is negligible, to rapidly improve symptoms and prevent mortality in WE.[6]

It is fundamental to start thiamine before glucose to prevent the precipitation of WE as well as, multivitamin prophylactic and magnesium therapy is also recommended.[6]

This case report highlights the importance of evaluating the nutritional deficits and various medical complications in anorexia nervosa patients, which frequently require a multidisciplinary assessment and monitoring. Even though WE is less often associated with AN, these conditions have a high mortality risk. Therefore, a high level of suspiciousness and careful surveillance is necessary. Also, early intervention and treatment with thiamine are crucial to fully re-establish patients' health and minimize WE progress to a non-treatable syndrome, such as Korsakoff syndrome.[6] Thiamine may prevent further deterioration of the patient's condition, especially in patients with a long history of nutrition deprivation. Hence, thiamine could be considered part of the standard treatment protocol in anorexia nervosa patients, since thiamine administration is safe, low cost and adverse clinical outcomes or death are rarely reported.[3]

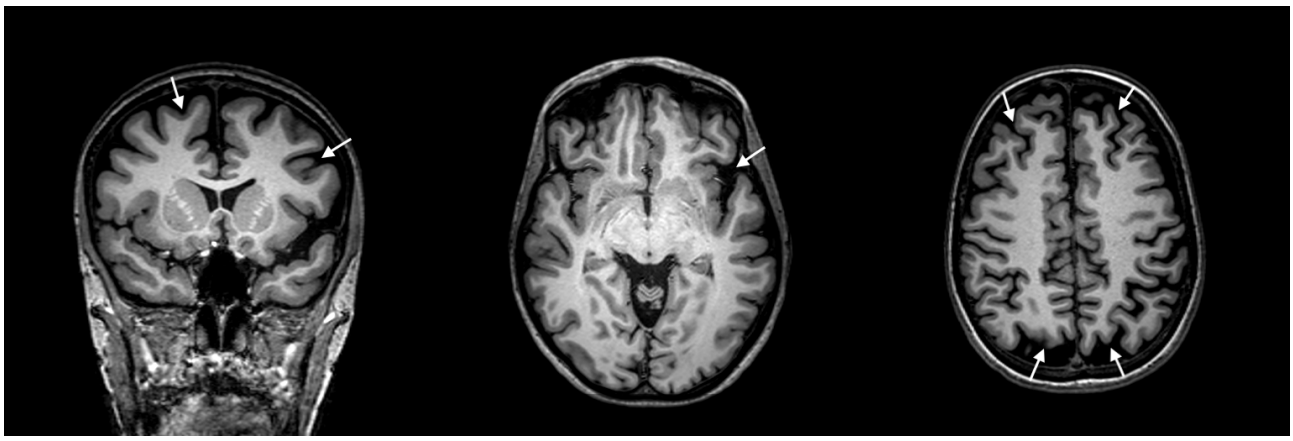

Figure 1. Magnetic resonance brain imaging (MRI) A: coronal image showing global atrophy of global cortical cerebrospinal fluid spaces, particularly on the left Sylvian fissure and the fronto-anterior, Image B-C: axial image global atrophy the fronto-anterior and frontoparietal regions,

Considerações Éticas

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Contributorship Statement

SN: Writing and reviewing of the manuscript, patient observation, article organization and planning.
FC and IS: Contribution to writing and review.
JS: Supervision and review of the manuscript.
AN: Supervision and manuscript conceptualization.

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