



ORIGINAL ARTICLE

Hyperinsulinemia and hyperglycemia: risk factors for recurrence of benign paroxysmal positional vertigo^{☆,☆☆}



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KEYWORDS

Vertigo;
Glucose metabolism disorders;
Carbohydrate metabolism;
Dizziness

Abstract

Introduction: Changes in carbohydrate metabolism may lead to recurrence of benign paroxysmal positional vertigo.

Objective: To evaluate the influence of the disturbance of carbohydrate metabolism in the recurrence of idiopathic BPPV.

Methods: A longitudinal prospective study of a cohort, with 41 months follow-up. We analyzed the results of 72 glucose–insulin curves in patients with recurrence of BPPV. The curves were classified into intolerance, hyperinsulinemia, hyperglycemia and normal.

Results: The RR for hyperinsulinism was 4.66 and $p=0.0015$. Existing hyperglycemia showed an RR=2.47, with $p=0.0123$. Glucose intolerance had a RR of 0.63, with $p=0.096$. When the examination was within normal limits, the result was RR=0.2225 and $p=0.030$.

Discussion: Metabolic changes can cause dizziness and vertigo and are very common in people who have cochleovestibular disorders. However, few studies discuss the relationship between idiopathic BPPV and alterations in carbohydrate metabolism. In the present study, we found that both hyperglycemia and hyperinsulinemia are risk factors for the recurrence of BPPV, whereas a normal test was considered a protective factor; all these were statistically significant. Glucose intolerance that was already present was not statistically significant in the group evaluated.

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PALAVRAS-CHAVE

Vertigem;
Transtornos do
metabolismo de
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Metabolismo dos
carboidratos;
Tontura

Conclusion: Hyperinsulinemia and hyperglycemia are risk factors for the recurrence of idiopathic BPPV and a normal exam is considered a protective factor.

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Hiperinsulinismo e hiperglicemia: fatores de risco para recorrência de vertigem postural paroxística benigna

Resumo

Introdução: As alterações do metabolismo do carboidrato podem levar a recorrência de vertigem posicional paroxística benigna.

Objetivo: Avaliar a influência dos distúrbios do carboidrato na recorrência da VPPB idiopática.

Método: Estudo longitudinal, do tipo coorte, prospectivo, com 41 meses de acompanhamento. Analisaram-se 72 resultados de curvas glicoinulinêmicas em pacientes portadores de recorrência de VPPB. As curvas foram classificadas em intolerância, hiperinsulinemia, hiperglicemia e normal.

Resultados: O hiperinsulinismo teve RR=4,66 e p=0,0015. A hiperglicemia apresentou um RR=2,47 e p=0,0123. Na intolerância a glicose o RR=0,63 e p=0,096. No exame normal, o RR=0,2225 e p=0,030.

Discussão: As alterações metabólicas podem causar tontura e vertigem e são muito frequentes na população que apresenta distúrbios cocleovestibulares. Contudo, poucos trabalhos falam sobre a relação entre a VPPB idiopática e as alterações nos carboidratos. No presente estudo, verificou-se que tanto a hiperglicemia, quanto o hiperinsulinismo são fatores de risco para recorrência de VPPB, ao passo que o exame normal foi considerado fator protetor, todos estes estatisticamente significantes. Já a intolerância à glicose não teve significância estatística no grupo avaliado.

Conclusão: O hiperinsulinismo e a hiperglicemia se comportam como fatores de risco para a recorrência de VPPB idiopática, assim como o exame normal como um fator protetor.

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Introduction

Benign postural (or positional) paroxysmal vertigo (BPPV) is the most common cause of dizziness in the adult population, and is classified as a peripheral vestibular syndrome.¹⁻³ BPPV predominates in females and in those aged greater than 50–60 years. In addition, approximately 30% of the elderly aged over 70 years will experience at least one episode of BPPV in their lives.^{4,5}

In most cases, the patient suffers from idiopathic BPPV. In secondary BPPV, some causes have been found, such as: traumatic brain injury, post-operative ear surgery, vertebralbasilar insufficiency, vestibular neuronitis and Ménière's disease.⁶ However, few studies have related metabolic changes with BPPV, or even identified such changes as a cause of secondary BPPV.⁷

Numerous metabolic disorders can affect the cochleovestibular apparatus.⁸⁻¹² Changes in carbohydrate metabolism, more precisely in glucose metabolism, have been associated with frequent causes of inner ear disorders.⁸⁻¹²

In carbohydrate disorders, especially those affecting glucose, some authors propose that, in patients with chronically hyperglycemic diabetes mellitus, the histopathological

changes of microangiopathy and peripheral neuropathy are present.^{11,13} Considering that the inner ear receives vascularization through terminal branches, such changes might compromise vestibular function, due to a decreased blood supply to this organ.

The post-mortem study of temporal bones performed by Yoda et al.¹⁰ found that patients with type 1 diabetes mellitus exhibit a much higher prevalence of otocone debris coming from the utricle, compared to healthy patients. In addition, these authors found that the prevalence of migration of such debris also was increased, in proportion to the years of illness. Thus, there is a greater chance of BPPV in patients with type 1 diabetes mellitus. Cohen et al.¹⁴ observed a 20% prevalence of diabetes mellitus in patients with BPPV aged between 65 and 74 years, and a 43% prevalence in people over 75 years.

In the literature, recurrence of BPPV varies between 20% and 30%.^{1,15} Several factors have been linked to the development of recurrence, including age, gender, and etiology of BPPV.^{1,15} However, it still remains uncertain whether or not there is a correlation with metabolic disorders.

The aim of this study was to evaluate the influence of carbohydrate disorders in the recurrence of idiopathic BPPV.

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