Clinical Imaging and Case Reports (ISSN 2770-9205)

Longitudinal Prospective Study on the Angiotensin Converting Enzyme Gene Polymorphism as a Genetic Biomarker of Diabetic Peripheral Neuropathy

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Received Date: April 05 2023
Accepted Date: April 08 2023
Published Date: May 05 2023

Abstract

Background: In order to give and anticipate secondary prevention measures as well as strengthen action on risk factors, particularly in primary care, it is crucial to identify patients who are at risk of developing diabetic peripheral neuropathy (DPN). It's noteworthy that nobody knows how common DPN is where we live.

Aims: 1) to examine ACE gene polymorphisms as a genetic marker of risk of developing DPN, and 2) to ascertain the prevalence of DPN in our environment. Research design and methods:a three-year longitudinal prospective cohort study with a randomly chosen sample of T2DM patients (N=283). Distribution of ACE gene polymorphisms (I=insertion; D=deletion) was identified. Using clinical and neurophysiological testing, DPN was identified.

Conclusions: Heterozygous ACE polymorphism (D/I) is a protective factor for DPN development in our dataset. DPN's cumulative incidence was important. More prospective research is required.

Keywords

Type 2 diabetes mellitus (T2DM); Angiotensin converting enzyme (ACE); Gene polymorphism; Diabetic peripheral neuropathy (DPN)

Introduction

The most often reported long-term diabetic consequence, known as diabetic peripheral neuropathy (DPN), can affect 20–40% of people with type 2 diabetes (T2DM). Additionally, DPN is thought to be responsible for up to 50–75% of non–traumatic foot amputations and is a significant contributing factor in individuals with diabetic foot ulceration [1].Screening and adequate treatment for DPN are therefore of utmost importance given its incidence, socioeconomic burden, impact on quality of life, and associated anxiety and depression [2]. Costs associated with providing healthcare will probably rise as T2DM prevalence is predicted to rise. The group of diabetics who are at a high risk of DPN must be identified using quick and effective approaches. Therefore, it is imperative to make considerable investments in clinical research that focuses on DPN early identification. This is especially true in primary care settings, where preventive approaches have demonstrated to be effective and efficient in the care of patients as well as in the control of modifiable risk factors [3].

In actual practise, the risk of foot ulceration is typically calculated using the DPN diagnostic. Therefore, the primary goal of preventative measures is to reduce the risk of potential foot injuries. However, several DPN risk variables that are modifiable by preventative measures have been found in addition to the metabolic control of diabetes [4]. Control of blood pressure [5], lipid profile [6], other causes (neurotoxic drugs, vitamin B1, B6, and B12 deficiency, and alcohol addiction) [7], lifestyle treatments (exercise and diet) [8], and research into novel therapeutic options [9–11] are a few of them. There is a clear familial tendency and possible link with genetic variables [12] in addition to the documented relationship between metabolic control and complications of diabetes, which is demonstrated by the absence of complications in some individuals.

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