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Evaluation of DISC1 Gene rs3738401 Polymorphism in Iranian Parkinson Patients affected by type 2 Diabetes

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ABSTRACT

Parkinson's disease is just a progressive disorder of the neural system that affects individual's movement. It develops slowly, sometimes beginning with barely obvious vibration in just one hand. But while a tremor could be the most recognized indication of Parkinson's disease, the disorder also generally causes hardness or slowing of movement. Type 2 diabetes referred to as adult-onset, is just an intense condition that affects the way in which the human body metabolizes sugar (glucose), the body's important supply of fuel.In this study, we evaluate of DISC1 gene rs3738401 polymorphism in Iranian Parkinson patients affected by type 2 Diabetes. The present research was conducted including number of 68Iranian Parkinson patients affected by type 2 Diabetes by employing ARMS-PCR process. To conclude, the information and statistics received from this study was analyzed by SPSS software. To sum up, the end outcome of current study explains considerable relation between DISC1 gene rs3738401 polymorphism in Iranian Parkinson patients affected by type 2 Diabetes. It could be an important genetic predisposition feature.

Keywords :*Parkinson, Diabetes,DISC1,rs3738401*

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INTRODUCTION

Parkinson's disease (PD) is just a intense and progressive movement disorder, and thus symptoms continue and worsen over time [1]. The source is unknown, and though there is presently no treatment, you can find treatment methods for instance medication and surgery to control its symptoms.

Parkinson's includes the malfunction and death of crucial nerve cells in the brain, named neurons. Parkinson's mainly affects neurons in a place of the brain labeled the substantia nigra [1,2].

Dopamine, a chemical that sends signals to the division of the brain that manages movement and skill. As PD progresses, the total amount of dopamine created in the brain decreases, leaving an individual unable to manage action normally[3].

Diabetes type 2 is a metabolic disease that is typified by hyperglycemia (high blood sugar) in the context of insulin resistance and relative lack of insulin. This really is in contrast to diabetes mellitus type 1, in which there's a complete insufficient insulin as a result of breakdown of islet cells in the pancreas.(4)

The progress of type 2 diabetes is the result of a mixture of lifestyle and genetic factors. While some of those factors are under personal control, for example diet and obesity, other factors aren't, such as for instance increasing age, female sexual category, and genetics [5]. Deficiencies in sleep have been associated with type 2 diabetes. This really is believed to act through its effect on metabolism. The nutritional position of a mother during fetal development could also have a role, with one planned mechanism being that of altered DNA methylation [6].

Disrupted in schizophrenia 1 is just a protein which is encoded by the DISC1 gene in humans. In coordination with a wide collection of interacting partners, DISC1 has been demonstrated to take part in

the regulation of cell proliferation, separation, migration, neuronal axon and dendrite outgrowth, mitochondrial transfer, fission and/or fusion, and cell-to-cell union [7, 8].
The DISC1 gene is located at chromosome 1q42.1 and overlies with a TSNAX-DISC1 trans gene splice variant, and at the protein rank. Of the isolateDISC2 open reading frame.[8] Multiple DISC1 isoforms have been acknowledged at the RNA level, including d RNA isomers, 4 have been confirmed to be translated that is extended form (L), Long variant isoform (Lv), tiny isoform (S), and particularly miniature isoform (Es).
Human being DISC1 is transcribed as two major splice variants, L shape and Lv isoform. The L and Lv transcripts use distal and proximal link sites, correspondingly, in exon 11. The L and Lv protein isoforms differ by just 22 amino acids within the C-terminus.(9)
Schizophrenia, Bipolar disorder and schizoaffective disorder are usual psychiatric sickness with elevated heritability and changeable phenotypes. The *Disrupted in Schizophrenia 1* (*DISC1*) gene, on chromosome 1q42, was firstly exposed and connected to schizophrenia in a Scottish kindred carrying a balanced translocation that disrupts *DISC1* and *DISC2*. [*10*]
The present survey was conducted including a number of 68Iranian Parkinson patients affected by type 2 Diabetes by utilizing ARMS-PCR system. Lastly, the facts received from this study were analyzed by SPSS software. **T**o be brief, the final result of present study shows substantial relation between DISC1 gene rs3738401 polymorphism in Iranian Parkinson patients affected by type 2 Diabetes. It could be a significant genetic predisposition factor.

MATERIAL AND METHODS

This research was performed on 68 patients with Parkinson and 100 healthy controls. The patient's samples were casually extracted from Hazrat-e-Abolfazl Mental Rehabilitation Center, Hamadan, Iran. The control group was selected from random participants whose health was established by medical diagnostic.

DNA extraction and PCR Reaction

Genomic DNA from venous blood samples were isolated using DNA Extraction Kit PGS (Model: PGS0051) in accordance with manufacturer's instructions. DNA were quantified with the NanoDrop technology (Thermo Scientific / NANODROP 1000 Spectrophotometer).The DISC1 gene rs3738401 polymorphism genotyping was performed base on the amplification-refractory mutation sequencing (ARMS) assay. The Thermal cycling conditions for ARMS-PCR were the following. Figure1 Utilizing the BIOER TECHNOLLOGY CO .LTD. (Model: TC-24/H.b) For The PCR We Used 20 µL Sample: 1 µL Forward Primer, 1 µL Reverse Primer, 6 µL Diluents' Water, 2 µL DNA 50 ng/ml, 10 µL Master Mix Sequence of Primers was 5'- GTT CCT TTC CCC AGC AGT G -3' ´as forward primer,5´-5'-AGA ATG CAT GTC ACG CTC T -3'as reverse normal primer and 5'-AGA ATG CAT GTC ACG CTC C -3'as reverse mutant primer.

PCR program used for DISC1 gene rs3738401 polymorphism:

cycle	temperature(Celsius)	Time
first	95	7 Minutes
Two to thirty-five	94 59 72	1minuteand15seconds 55Seconds 30seconds
thirty-six	72	5Minutes

Gel Electrophoresis

The electrophoresis was carried out using 1% Gel Red stained agarose gel, at 80V for 35 min We Use Horizontal Electrophoresis Cell (Model: JY-SPAT) with TBE Buffer (PH=8.3) , Ladder Were Used 50bp DNA Ladder (Jena Bioscience) After electrophoresis, the amplified PCR products were Perceive under U. V. light.

Statistical analysis

Statistical analyses were conducted using with the SPSS software (Statistical Package for Social Sciences) version18. Chi- square test ($\chi 2$), was used to check the association between two categorical variables or even to detect difference between several proportions. Pearson chi-square was used to investigate the connection involving the DISC1 gene rs3738401 polymorphism and Parkinson.

RESULTS

We analyzed 68 genotyped patients with Parkinson, and 100 healthy controls, for the DISC1 gene rs3738401 polymorphism.
rs3738401 polymorphism frequencies were in equilibrium in patients and controls. Patients showed an extensively increased frequency of the rs3738401 polymorphism allele compared with controls. Thus the rs3738401 polymorphism allele would confer a slightly increased risk of developing late onset Parkinson.

Table1: Genotype Table of DISC1 gene rs3738401 polymorphism:

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Genotype * Group	168	100.0%	0	.0%	168	100.0%

Genotype * Group **Crosstabulation**

Count

		Group		
		Case	Control	Total
Genotype	GG	56	93	149
	GT	12	6	18
	TT	0	1	1
Total		68	100	168

The results of genotyping are depicted in Table1: The following genotypes were identified for DISC1 gene rs3738401 polymorphism.
Table 1 showed that there were significantly correlation between DISC1 gene rs3738401 polymorphism and Parkinson. Therefore, DISC1 gene rs3738401 polymorphism may be a genetic predisposing factor for Parkinson in Iranian population.

Table2: Chi- square test ($\chi 2$) for analyzing DISC1 gene rs3738401 polymorphism:

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.322[a]	2	.042
Likelihood Ratio	6.577	2	.037
Linear-by-Linear Association	3.206	1	.073
N of Valid Cases	168		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is .40.

Discussion:

The evidence exposed in the piece of writing confirms that DISC1 gene rs3738401 polymorphism plays fundamental role in Iranian patients. In accordance with this, an increased frequency of the allele among patients with Parkinson has been seen.
By analyzing a group of Iranian patients, it is understood that the DISC1 gene rs373401 has been connected with this disorder. As a resultDISC1 gene rs3738401 polymorphism is actually a noteworthy genetic tendency factor for in Iranian Parkinson patients. Therefore, DISC1 gene rs3738401 polymorphism may be a genetic predisposing element for Parkinson disorder treatment in Iranian population.

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