Medical Xpress

Study on origin of mutation that causes fatal familiar insomnia

January 7 2009

A PhD thesis at the University of the Basque Country (UPV/EHU) has studied the origin of the mutation that causes Fatal Familiar Insomnia (FFI). In the Autonomous Community of the Basque Country there is a high rate of carriers of this mutation — 50% of all the cases registered in the whole of Spain.

Fatal Familiar Insomnia (FFI) is one of the diseases considered as rare — there are less than 100 cases described throughout the world. FFI prevents the patient getting to sleep to the point where she or he cannot ever sleep and which, after a number of months thus, causes death. ILF is a genetic illness caused by the D178N mutation and belonging to the group of diseases known as Transmissible Spongiform Encefalopathies (TSE).

The author of the PhD is Ms Ana Belén Rodríguez Martínez, who presented her thesis with the title, *Fatal Familiar Insomnia in the Basque Country: the search for the founding effect of mutation D178N (-129M) and the effects of oxidative stress on retrospective samples*. Ms Rodríguez has a degree in Biology and currently works as an associate researcher on a Neiker-Tecnalia project. She carried out her research thesis under the direction of Dr. Marian Martínez de Pancorbo, Profesor of Cell Biology at the UPV/EHU Pharmacy Faculty and of Dr. Juan José Zarranz, Head of Neurology at Cruces Hospital and Professor of Neurology in the Faculty of Medicine and Odontology at the UPV/EHU.

The undertaking of this PhD thesis has been possible thanks to the

collaboration by and participation of health researchers and professionals from various spheres, both national and international (The bodies and institutions referred to are detailed at the end of the paper).

Origin of the mutation

In 1996, following on from the outbreak of the Creutzfeldt-Jakob ("mad cow") disease, the European Union launched systems for monitoring the prionic group of illnesses — the group to which FFI belongs. It was only then that the high rate of carriers of the mutation (D178N) responsible for FFI was detected in the Basque Country Autonomous Community (with 50% of all cases registered in Spain).

The area is characterised by its mountainous orography, and which has favoured cultural and genetic isolation. These features caused researchers to think that there might be a 'founder effect' of the mutation in the Basque Country — 'founder effect' is when a new population of individuals is formed from a very small number, with a large proportion thereof carrying the same genetic characteristics.

Given this situation, three targets were set: to look for the possible founder effect of the D178N mutation amongst patients in the Basque Country; establish relations between carriers in the Basque Country with other cases in Spain and Europe; and fix the historical time of the most recent common ancestor.

Same genetic families

After studying cases of FFI in the Basque Country, the researcher observed that genetic families amongst the patients coincided with each other. She concluded, thus, that the high rate of the disorder is due to a 'founder effect' of the mutation in this geographical area. Moreover,

genealogical data link most of the cases and fix the oldest mutation carrier generations in an area in the south of the Basque Country in the XVII and XVIII centuries.

In comparison with other regions, Dr. Rodríguez concluded that links can be established between cases in Germany and those of the Italian Veneto region, on the one hand; between Italians of Tuscany and some Spanish cases, on the other; and that not all Spanish cases have the same origin. On estimating the age of the most recent common ancestor, they were able to calculate that two of these variants of the mutation arose over 2,000 years ago.

Source: Elhuyar Fundazioa

Citation: Study on origin of mutation that causes fatal familiar insomnia (2009, January 7) retrieved 6 May 2024 from
https://medicalxpress.com/news/2009-01-mutation-fatal-familiar-insomnia.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.