The dopamine transporter gene influences alcohol withdrawal seizures

January 3 2008

“People with alcoholism continue to die because of complications related to withdrawal symptoms, mainly delirium tremens – delirium associated with visual hallucinations – and /or seizures,” said Philip Gorwood, professor of psychiatry at INSERM and corresponding author for the study.

“Benzodiazepine has helped to prevent such severe complications, but there are still some patients – approximately three percent – for whom prevention is difficult because we have few cues to detect which ones are highly vulnerable. One approach is to look at the genetic vulnerability of the patient as part of a gene/environment interaction, which helps to distinguish patients who may or may not develop the phenotype, in this case the ‘storm’ triggered by an acute interruption of alcohol consumption.”

Frédéric Limosin, professor of psychiatry at the University of Reims, France agrees that alcoholism must be regarded as a complex disorder arising from a combination of genetic and environmental factors.

“Alcohol can enhance dopaminergic activity in mesolimbic mesocortical circuits, thought to be important for reward and reinforcement behaviors,” he said. “Thus, among the different candidate genes, those acting in the dopaminergic pathway may be more specifically involved. Several previous studies have found an association between some polymorphisms of the DAT gene and the occurrence of withdrawal seizures in alcohol-dependent patients. Results from this study could

help identify patients at high risk of developing this complication, and/or to prevent the seizures more efficiently."

"If a marker is going to be used for clinical purpose, it is important that we use the marker that is really involved, not a neighbour which is only partially involved," explained Gorwood. "This is why we decided to look at a large sample of patients experiencing withdrawal seizures, also seven other makers in the DAT1 gene, as well as potentially confounding factors like gender, severity of dependence, and the presence of other complications."

Gorwood and his colleagues examined 250 alcohol-dependent subjects (175 men, 75 women) recruited from three university hospitals in Paris suburbs, of whom 24 percent exhibited withdrawal seizures. All participants were genotyped for the variable nucleotide tandem repeat (VNTR) of the gene that encodes DAT1, as well as for seven single nucleotide polymorphisms (SNPs) encompassing the DAT1 gene. Severity of alcohol dependence was also measured.

Results linked four polymorphisms – the DAT1-VNTR, rs27072, rs27048, and rs2963238 – to an altered risk for withdrawal seizures.

"As the authors state, the physiopathology underlying this association between polymorphisms of the DAT1 gene and the occurrence of withdrawal seizures in alcohol-dependent subjects remains unclear," said Limosin. "One hypothesis is that the DAT1 polymorphisms could modulate neuronal excitability, and therefore be associated with a reduced seizure threshold during alcohol withdrawal. Another hypothesis may be based on the relationships that exist between dopamine and other neurotransmitters, notably glutamate through N-methyl-D-aspartate (NMDA) receptors. It will be necessary to realize further studies, such as experimental studies, to better characterize the underlying biochemical mechanisms at work."

Source: University of Reims

Citation: The dopamine transporter gene influences alcohol withdrawal seizures (2008, January 3) retrieved 10 April 2024 from https://medicalxpress.com/news/2008-01-dopamine-gene-alcohol-seizures.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.