Impaired decision-making and brain shrinkage in alcoholism

Submitted by Emmanuel Lemoine on Wed, 04/22/2015 - 16:52

Titre
Impaired decision-making and brain shrinkage in alcoholism

Type de publication
Article de revue

Auteur

Editeur
Elsevier

Type
Article scientifique dans une revue à comité de lecture

Année
2012

Langue
Anglais

Date
2012/11/28

Numéro
3

Pagination
125-33

Volume
29

Titre de la revue
Eur Psychiatry

ISSN
1778-3585

Résumé en anglais
Alcohol-dependent individuals usually favor instant gratification of alcohol use and ignore its long-term negative consequences, reflecting impaired decision-making. According to the somatic marker hypothesis, decision-making abilities are subtended by an extended brain network. As chronic alcohol consumption is known to be associated with brain shrinkage in this network, the present study investigated relationships between brain shrinkage and decision-making impairments in alcohol-dependent individuals early in abstinence using voxel-based morphometry. Thirty patients performed the Iowa Gambling Task and underwent a magnetic resonance imaging investigation (1.5T). Decision-making performances and brain data were compared with those of age-matched healthy controls. In the alcoholic group, a multiple regression analysis was conducted with two predictors (gray matter [GM] volume and decision-making measure) and two covariates (number of withdrawals and duration of alcoholism). Compared with controls, alcoholics had impaired decision-making and widespread reduced gray matter volume, especially in regions involved in decision-making. The regression analysis revealed links between high GM volume in the ventromedial prefrontal cortex, dorsal anterior cingulate cortex and right hippocampal formation, and high decision-making scores (P<0.001, uncorrected). Decision-making deficits in alcoholism may result from impairment of both emotional and cognitive networks.

URL de la notice

DOI

Titre abrégé
European psychiatry

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