Influence of brain-derived neurotrophic-factor and apolipoprotein E genetic variants on hippocampal volume and memory performance in healthy young adults.

Unravelling the impact of genetic variants on clinical phenotypes is a challenging task. Apolipoprotein E (ApoE) and brain-derived neurotrophic factor (BDNF) play an important role in cell growth, regeneration, synaptic plasticity, learning and memory processes. The aim of the present study was to examine the impact of BDNF Val66Met- and ApoE-polymorphisms and their interactions on hippocampal morphology and memory functions in healthy young adults. Hippocampal volume and memory performance of 135 healthy individuals, aged 24.6 ± 3.2 years, were assessed, using magnetic resonance imaging and the Inventory for Memory diagnostics. The performance of BDNF-Met66 carriers was significantly lower in working memory (P = 0.03) compared with non carriers, whereas no further differences were observed either in cognitive performance or in hippocampal volumes between the groups. Age, BDNF Val66 Met polymorphism and the interaction factor BDNF genotype x age were significantly associated with the variation of working memory scores (P = 0.01, 0.01, 0.02 respectively). No statistically significant differences were detected in the volumes of hippocampi and in memory phenotypes between individuals.
carrying the ApoE E4 allele and those without it. The analysis did not reveal an impact of gene-gene interaction between BDNF and ApoE genes on hippocampal volumes or memory performance. BDNF Val66Met polymorphism seems to influence working memory function and modulate the effects of ageing on working memory in healthy young adults.