Multi-level biomarker analysis of nitric oxide synthase isoforms in bipolar disorder and adult ADHD.


Abstract

INTRODUCTION:
Several studies have shown altered levels of nitric oxide (NO) and its stable metabolites (NOx-) in blood and cerebrospinal fluid of psychiatric patients. The aim of our study was to replicate previous findings and investigate the influence of the nitrinergic system in bipolar disorder and adult attention-deficit/hyperactivity disorder (aADHD) in particular.

METHODS:
The concentrations of NO2- and NO3- in peripheral blood in a sample of aADHD, bipolar disorder (BPD) and controls were analysed. The sample was genotyped for a three marker haplotype in the NOS3 gene (rs2070744, rs1799983 and Intron 4 VNTR) and for genetic variants of the NOS1 gene (NOS1 ex 1c, NOS1 ex 1f). Finally, qRT PCR was performed.

RESULTS:
We found significantly lower NOx- levels in BPD (p<0.001). rs2070744 T/T-carriers of the whole sample showed increased mRNA expression of NOS3 (p=0.05). Only in BPD an influence of rs2070744 was seen regarding NO metabolite levels; C/C carriers displayed lower NOx- levels (p=0.05).

CONCLUSION:
We could replicate and extend previous findings showing altered NOx- levels in BPD and an influence of NOS3 rs2070744 on NOS3 expression and NOx- concentration. Together, these data point to a role of the nitrinergic pathway in BPD.