

Article: 0119

Topic: S48 - Symposium 49: Genetics and functional imaging underlying major depressive and anxiety disorders

Integrated Functional Imaging and Genetics in Depression and Anxiety

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Introduction: Depression and anxiety disorders show a high comorbidity based on common pathophysiological mechanisms. Childhood environmental and life stressors are leading factors in both disorders and result in stable changes of genetic expression mediated by epigenetics, which has been found to impact in the transcription of genes, influence neurogenesis, neuroplasticity and neuronal connectivity.

Aims: To provide an overview about functional neuroimaging genetics in MDD and anxiety disorders.

Methods: Functional MRI, epigenetic and genetic information was obtained in a cohort of patients with MDD with high and low levels of anxiety and healthy controls. Associations between methylation of SLC6A4, genetic variants and brain function and connectivity was analysed.

Results: Higher methylation of SLC6A4 gene was associated with higher BOLD response during emotion processing and lower BOLD response during higher order cognitive processes. Specific association with anxiety and depression are further analysed.

Conclusions: Our study provides further support to the hypothesis that particular DNA methylation states that are associated with brain function during emotion processing are detectable in the periphery. The influence of anxiety or depression on this association is discussed.