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# Association between inflammation and neural plasticity biomarkers in olfactory neuroepithelium – derived cells and cognitive performance in patients with major depressive disorder

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**Introduction:** Inflammation and neural plasticity play a significant role in major depressive disorder (MDD) pathogenesis and cognitive dysfunction. The olfactory neuroepithelium (ON), closely related to the central nervous system (CNS), allows a non-invasive, low-cost study of neuropsychiatric disorders. However, few studies have used ON cells to ascertain them as biomarkers for MDD.

**Objectives:** Determine the relationship between inflammatory/neural plasticity markers and cognitive functioning in MDD patients and healthy controls.

**Methods:** Sample: 9 MDD patients and 7 healthy controls. Exclusion criteria: other Axis I mental disorders (patients) or any mental disorder (controls) and any inflammatory, autoimmune, or CNS diseases. Assessment: sociodemographic, clinical, and cognitive variables (CANTAB) were recorded. mRNA was isolated from ON cells and MAPK14, IL6, TNF- $\alpha$ , Mecp2, BDNF, GSK3, GRIA2, and FosB gene expression levels were quantified using quantitative polymerase chain reaction.

**Results:** MDD patients showed decreased levels of BDNF ( $p=0.022$ ), GSK3 ( $p=0.027$ ), and working memory ( $p=0.024$ ) compared with healthy controls. In healthy controls, planning was positively correlated with NRF2, BDNF, and MAPK14 gene expression. In MDD patients no correlation between cognitive parameters and inflammation/neural plasticity biomarkers was found.

**Conclusions:** These results reveal that: (1) Plasticity biomarkers such as BDNF and GSK3 could be useful diagnostic tools for MDD (2) MDD is associated with working memory deficits; (3) no association could be determined between planning and NRF2, BDNF, and MAPK14 gene expression in MDD and (4) the ON is a promising model in the study of neuropsychiatric disorders.

**Disclosure:** No significant relationships.

**Keywords:** biomarkers; cognition; inflammation; Depression