

Changes in prefrontal cortical myelination in olfactory bulbectomized mice is associated with depressive-like behavior

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Recent study has reported that demyelination is associated with the development of depression. Olfactory bulbectomized (OBX) rodents are a useful experimental animal model for depressive disorder. However, it remains unclear about the change in myelination in the brain of OBX mice. To address this question, we determined quantity of myelin-associated protein such as myelin basic protein (MBP), myelin proteolipid protein, myelin-associated glycoprotein (MAG), myelin-associated oligodendrocyte basic protein, myelin oligodendrocyte glycoprotein and cyclicnucleotide phosphodiesterase (CNPase) in the prefrontal cortex (PFC) and dorsal hippocampus 2 or 3 weeks after surgery when OBX mice begin to exhibit depressive-like behaviors. Then, we also investigated the association with depressive-like behavior and changes in myelin-associated protein. OBX mice showed depressive-like behavior in the tail-suspension test and decreases in MBP, MAG and CNPase in the PFC, but not hippocampus 3 weeks after surgery. Furthermore, linear regression analysis revealed the significant correlations between the changes in prefrontal cortical myelin-associated protein (MBP, MAG and CNPase) and the immobility time 3 weeks after surgery. These findings indicate that OBX-induced demyelination in the PFC is associated with depressive-like behavior.