NEURAMINIDASE-INDUCED NEUROINFLAMMATION CAUSES ANXIETY AND MICROGLIOSIS IN THE AMYGDALA

Ms. Ana León-Rodríguez[1], Ms. María del Mar Fernández-Arjona[1,3], Ms. Carmen Pedraza[2,3], Mr. Jesús M M. Grondona[1,3], Ms. María Dolores López-Ávalos[1,3]

[1]University of Málaga, Departamento de Biología Celular, Genética y Fisiología (Área de Fisiología Animal), Málaga, Spain, [2]University of Málaga, Departamento de Psicobiología y Metodología en las CC, Málaga, Spain, [3]Instituto de Investigación Biomédica de Málaga-IBIMA, Málaga, Spain

An intracerebroventricular (ICV) injection of neuraminidase (NA) within the lateral ventricles originates an acute event of neuroinflammation, which is solved to a great extent after two weeks. Recently, neurological problems or behavioral alterations have been associated with neuroinflammation. Although the majority of them fade along with inflammation resolution, the possibility of long-term sequelae should be taken into consideration. Thus, we aimed to explore if NA-induced neuroinflammation provokes behavioral or neurological disturbances at medium (2 weeks) and long (10 weeks) term. Initially, rats were ICV injected with NA or saline. Two or 10 weeks later they were made to perform a series of neurological tests and behavioral evaluations (open field test). The neuroinflammation status of the brain was studied by immunohistochemistry and qPCR. While no neurological alterations were found, the open field test revealed an increased anxiety state 2 weeks after NA administration, which was not observed after 10 weeks. In accordance with this behavioral findings, an overexpression of the molecular pattern receptor TLR4 was revealed by qPCR in hypothalamic tissue in NA treated animals after 2 weeks of ICV, but not after 10 weeks. Moreover, histological studies showed a microgliosis in the amygdala of NA injected rats 2 weeks post-ICV, as well as a slightly activated state evidenced by morphometric parameters of these cells. These histological findings were not present 10 weeks after the ICV injection. These results suggest that NA-induced neuroinflammation might cause anxiety, with no neurological manifestations, in the medium term, along with a mild microglial activation in amygdala. Such symptoms seem to revert, as they were not detected 10 weeks after NA administration.