ABSTRACT

Multiple sclerosis (MS) is a neurodegenerative disorder, instigated due to chronic inflammation of the myelin sheath of neurons present in central nervous system (CNS). These attacks result in astrogliosis, demyelination and neuronal death. Autoimmunity is one of the key factors that promote MS in humans. Experimental Autoimmune Encephalomyelitis (EAE) is a screening model that helps to identify disease targets in MS in animals. In this research, we explored the effects of asiaticoside-A, and bacoside-A against lipopolysaccharide (LPS) activated microglia and astrocyte cultures. We also evaluated the action of both compounds against acute and chronic models of EAE in mice. The results suggested that both asiaticoside-A and bacoside-A can able to prevent the LPS induced activation of microglia and astrocytes by promoting cell proliferation, lowered the production NO and TNFα in cultures. In acute and chronic models of EAE, both compounds reduced the clinical score and prevented locomotor coordination deficits when compared to non-treated animals. In both models, they downregulated the expression of IL-6, IL-17a, TNFα, and CCL-5 in brain tissues of EAE animals.Meanwhile, the treatment with these compounds showed poor or non-significant effects on upregulating NCAM1, BDNF1, and FOXP3 in the affected animals. The histopathological analysis also supports the protective effects of these compounds against EAE in mice. The animals treated with asiaticoside-A and bacoside-A showed a reduction in neutrophil infiltration, cellular changes, and demyelination in the brain and spinal cord. In conclusion, asiaticoside-A and bacoside-A showed neuroprotective action against neuroinflammation induced by EAE, through the inhibition of inflammatory cytokines and chemokine but not by T cell regulation, BBB protection or via promotion of neural growth factor like BDNF1.