Abstract

Carnosine (β-alanyl-L-histidine) is a natural dipeptide with multiple neuroprotective properties. Previous studies have advertised that carnosine scavenges free radicals and displays anti-inflammatory activity. However, the underlying mechanism and the efficacies of its pleiotropic effect on prevention remained obscure. In this study, we aimed to investigate the anti-oxidative, anti-inflammative, and anti-pyroptotic effects of carnosine in the transient middle cerebral artery occlusion (tMCAO) mouse model. After a daily pre-treatment of saline or carnosine (1000mg / kg / day) for 14 days, mice (n=24) were subjected to tMCAO for 60 min and continuously treated with saline or carnosine for additional 1 and 5 days after reperfusion. The administration of carnosine significantly decreased infarct volume 5 days after the tMCAO ($*p < 0.05$) and effectively suppressed the expression of 4-HNE, 8-OHdG, Nitrotyrosine 5 days, and RAGE 5 days after tMCAO. Moreover, the expression of IL-1β was also significantly suppressed 5 days after tMCAO. Our present findings demonstrated that carnosine effectively relieves oxidative stress caused by ischemic stroke and significantly attenuates neuroinflammatory responses related to IL-1β, suggesting that carnosine can be a promising therapeutic strategy for ischemic stroke.