ABSTRACT

Stachybotrys microspora triprenyl phenol (SMTP)-44D has both anti-oxidative and anti-inflammatory activities, but its efficacy has not been proved in relation to the pathological changes of neurovascular unit (NVU) and neurovascular trophic coupling (NVTC) in ischemic stroke. Here, the present study was designed to assess the efficacies of SMTP-44D, moreover, compared with the standard neuroprotective reagent edaravone in ischemic brains. ICR mice were subjected to transient middle cerebral artery occlusion (tMCAO) for 60 min, SMTP-44D (10 mg/kg) or edaravone (3 mg/kg) was intravenously administrated through subclavian vein just after the reperfusion, and these mice were examined at 1, 3 and 7 d after reperfusion. Compared with the vehicle group, SMTP-44D treatment revealed obvious ameliorations in clinical scores and infarct volume, meanwhile, markedly suppressed the accumulations of 4-HNE, 8-OHdG, nitrotyrosine, RAGE, TNF-α, Iba-1 and cleaved caspase-3 after tMCAO. In addition, SMTP-44D significantly prevented the dissociation of NVU and improved the intensity of NAGO/BDNF and the number of BDNF/TrkB and BDNF/NeuN double positive cells. These effects of SMTP-44D in reducing oxidative and inflammatory stresses were similar to or stronger than those of edaravone. The present study demonstrated that SMTP-44D showed strong anti-oxidative, anti-inflammatory, and anti-apoptotic effects, moreover, the drug also significantly improved the NVU damage and NVTC in the ischemic brain.