Ac-YVAD-cmk

Intracerebral hemorrhage (ICH) is acknowledged as a serious clinical problem lacking effective treatments. And caspase-1-mediated inflammatory response happened during the progression of ICH. Therefore, we aimed to investigate the effects of caspase-1 inhibitor Ac-YVAD-cmk on ICH.

MATERIALS AND METHODS: Microglia cells were isolated and activated by thrombin for 24 h. Then the transcript and protein expressions of NLRP3 and inflammatory factors were assessed by RT-PCR and western blotting. Moreover, Ac-YVAD-cmk was injected into the ICH model. The mNSS and brain water content were tested at 24 h post-ICH. Finally, the pathological changes of microglia activation following ICH were discovered by the immunohistochemical and HE staining ways.

RESULTS: Ac-YVAD-cmk inhibited the activation of pro-caspase-1 and decreased brain edema, in association with decreasing activated microglia and the expression of inflammation-related factors at 24 h post-ICH. Consequently, Ac-YVAD-cmk reduced the release of mature IL-1β/IL-18 in perihematoma, improved the behavioral performance, and alleviated microglia in perihematoma region in ICH rats.

CONCLUSIONS: These results indicate that caspase-1 could amplify the plural inflammatory responses in the ICH. Administration of Ac-YVAD-cmk has the potential to be a novel therapeutic strategy for ICH [1].

The Caspase-1 T activation complexes (inflammasomes) can facilitate caspase-1 and IL-1β processing, which amplifies the inflammatory response.

In a study Li et al. examined whether caspase-1 activation contributes to irradiation-induced damage to neural stem and progenitor cells (NSPCs). They found that X-ray irradiation induced activation of caspase-1 in NSPCs in vitro and in vivo. Next, using a caspase-1 inhibitor (Ac-YVAD-CMK) to block caspase-1 activation in vitro and in vivo, we further demonstrated that X-ray irradiation may inhibit proliferation, induce senescence of NSPCs through caspase-1 activation. Together, these results suggest that caspase-1 activation is involved in irradiation-induced damage to NSPCs [2]

1)
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2)
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