Brain injury-associated biomarkers of TGF-beta1;S100B;GFAP;NF-L;tTG;AbetaPP;and tau were concomitantly enhanced and theUPS was impaired during acute brain injury caused by Toxocara canis in mice

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摘要

Abstract

Background: Because the outcomes and sequelae after dierent types of brain injury (BI) are variable and dicult to predict, investigations on whether enhanced expressions of BI-associated biomarkers (BIABs), including transforming growth factor 1 (TGF-1), S100B, glial brillary acidic protein (GFAP), neuro lament light chain (NF-L), tissue transglutaminases (tTGs), -amyloid precursor proteins (APP), and tau are present as well as whether impairment of the ubiquitin-proteasome system (UPS) is present have been widely used to help delineate pathophysiological mechanisms in various BIs. Larvae of Toxocara canis can invade the brain and cause BI in humans and mice, leading to cerebral toxocariasis (CT). Because the parasitic burden is light in CT, it may be too cryptic to be detected in humans, making it dicult to clearly understand the pathogenesis of subtle BI in CT. Since the pathogenesis of murine toxocariasis is very similar to that in humans, it appears appropriate to use a murine model to investigate the pathogenesis of CT. Methods: BIAB expressions and UPS function in the brains of mice inoculated with a single dose of 250 T. canis embryonated eggs was investigated from 3 days (dpi) to 8 weeks post-infection (wpi) by Western blotting and RT-PCR. Results: Results revealed that at 4 and 8 wpi, T. canis larvae were found to have invaded areas around the choroid plexus but without eliciting leukocyte in ltration in brains of infected mice; nevertheless, astrogliosis,

an indicator of BI, with 78.9??42.0-fold increases in GFAP expression was present. Meanwhile, markedly increased levels of other BIAB proteins including TGF-1, S100B, NF-L, tTG, APP, and tau, with increases ranging 2.0??2.0- fold were found, although their corresponding mRNA expressions were not found to be present at 8 wpi. Concomitantly, UPS impairment was evidenced by the overexpression of conjugated ubiquitin and ubiquitin in the brain. Conclusion: Further studies are needed to determine whether there is an increased risk of CT progression into neurodegenerative disease because neurodegeneration-associated APP and phosphorylated tau emerged in the brain.