Involvement of TG-interacting factor in microglial activation during experimental traumatic brain injury.

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Abstract

Traumatic brain injury (TBI) is a complex injury involving several physiological alterations, potentially leading to neurological impairment. Previous mouse studies using high-density oligonucleotide array analysis have confirmed the upregulation of transforming growth-interacting factor (TGIF) mRNA in TBI. TGIF is a transcriptional corepressor of transforming growth factor beta (TGF-β) signaling which plays a protective role in TBI. However, the functional roles of TGIF in TBI are not well understood. In this study, we used confocal microscopy after immunofluorescence staining to demonstrate the increase of TGIF levels in the activated microglia of the pericontusional cortex of rats with TBI. Intracerebral knockdown of TGIF in the pericontusional cortex significantly downregulated TGIF expression, attenuated microglial activation, reduced the volume of damaged brain tissue, and facilitated recovery of limb motor function. Collectively, our results indicate that TGIF is involved in TBI-induced microglial activation, resulting in secondary brain injury and motor dysfunction. This study investigated the roles of transforming growth-interacting factor (TGIF) in a traumatic brain injury (TBI)-rat model. We demonstrated the increase of TGIF levels in the activated microglia of the pericontusional cortex of rats with TBI. Intracerebral knockdown of TGIF in the pericontusional cortex of the TBI rats significantly attenuated microglial activation, reduced the volume of damaged brain tissue, and facilitated recovery of limb motor function. We suggest that inhibition of TGIF might provide a promising therapeutic strategy for TBI.