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Toll-like receptor-2 mediates neurogenesis in ischemic brain in mice

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In the present study, we investigated role of Toll-like receptor-2 (TLR2) in neurogenesis in ischemic brain. Wild type mice (WT) and TLR2 gene knockout mice (TLR2KO) were used to establish mouse model of permanent occlusion of middle cerebral artery (pMCAO). Neurological function, BrdU positive cells, and inflammatory responses in the brain were evaluated. The differences between the groups were analyzed with one-way ANOVA. $P<0.05$ was considered as statistically significant. The results showed that: 1. Compared to sham group, 7 days after pMCAO, significantly increased BrdU positive cells were observed in ischemic group. The number of BrdU positive cells in T2-S and T2-P groups was significantly more than that in WT-S and WT-P groups, respectively ($p<0.05$). 2. The motor function impairments were observed in WT mice. There were significant differences in standing time and stand cycle between T2-P and WT-P ($p<0.05$). 3. Six hours after cerebral ischemia, the P-Akt, p-GSK, and Bcl-xl increased significantly in WT-P group compared with WT-S. However, there was no significant difference in P-Akt, p-GSK, and Bcl-xl between WT-P and T2-P. Interestingly, the levels of p-GSK and Bcl-xl were significantly higher in T2-S and T2-P groups than that in WT-S group ($p<0.05$). We concluded that cerebral ischemia induced endogenous proliferation of neuronal stem cells. TLR2 gene knockout attenuated the impairments in some motor functions induced by pMCAO. TLR2KO enhanced the proliferation and survival of the endogenous neuronal stem cells, which might attribute to the higher levels of pGSK and Bcl-xl under basic conditions.

Biography

Fang Hua has completed his MD and PhD at the age of 36 years from China Medical University and postdoctoral studies from East Tennessee State University School of Medicine. He is a neurologist and services as the vice dean of Brain Hospital at the Affiliated Hospital of Xuzhou Medical College, China. He has published more than 30 papers in reputed journals.

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