FGF1, also known as acidic fibroblast growth factor (aFGF), is a growth factor and signaling protein encoded by the FGF1 gene.

Acidic fibroblast growth factor (aFGF) is a neurotrophic factor which is a powerful neuroprotective and neuroregenerative factor for nervous system. Prior study had shown that the levels of FGFs significantly increase following ischemic injury, reflecting a physiological protection mechanism. However, few reports demonstrated the efficacy of applying aFGF in cerebral ischemia. A recent report showed that the intranasal aFGF treatment improved neurological functional recovery; however, it did not significantly reduce the lesion size in ischemic rats. The present study examines the neuroprotective effect of aFGF on cortical neuron-glial cultures under oxygen glucose deprivation (OGD)-induced cell damage and investigates whether epidural application of slow released aFGF could improve benefit on ischemic stroke injury in conscious rats. We used topical application of aFGF mixed in fibrin glue, a slow release carrier, over the peri-ischemic cortex and examined such treatment on cerebral infarction and behavioral impairments of rats subjected to focal cerebral ischemia (FCI). Results demonstrate that aFGF effectively protected cortical neuron-glial cultures from OGD-induced neuronal damage. Neurite extension from cortical neurons was significantly enhanced by aFGF, mediated through activation of AKT and ERK. In addition, topical application of fibrin glue-mixed aFGF dose-dependently reduced ischemia-induced brain infarction and improved functional restoration in ischemic stroke rats. Slow released aFGF not only protected hippocampal and cortical cell loss but reduced microglial infiltration in FCI rats. Our results suggest that aFGF mixed in fibrin glue could prolong the protective/regenerative efficacy of aFGF to the damaged brain tissue and thus improve the functional restorative effect of aFGF [1)].

1)
Tsai MJ, Tsai SK, Huang MC, Liou DY, Huang SL, Hsieh WH, Huang WC, Huang SS, Cheng H. Acidic FGF Promotes Neurite Outgrowth of Cortical Neurons and Improves Neuroprotective Effect in a Cerebral Ischemic Rat Model. Neuroscience. 2015 Aug 1. pii: S0306-4522(15)00701-0. doi: 10.1016/j.neuroscience.2015.07.074. [Epub ahead of print] PubMed PMID: 26241340.