Gastrodia Elata Bl. Plays a Neuro-Protection Role in Kainic Acid-Induced Chronic Epileptic Seizure Rat Model

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Background & Aim :

Our studies have known that Gastrodia elata (GE) has an anti-epileptic seizure effect in Kainic acid (KA)-treated rat, and the mossy fiber sprouting develops in the hippocampus region 6 weeks after KA administration. The mossy fiber sprouting is reported that has closely relationship to the formation of epileptic focus. Therefore, the purpose of the present study was to investigate the role of GE in chronic epileptic seizure.

Materials & Methods :

We established a chronic epileptic seizure model by peritoneal administration (i.p.) of KA (12 mg/kg) in Sprague-Dawley (SD) rat. Oral administration of GE (1.0g/kg) for 5 days/week for 6 weeks continuously starts 24 hr after KA i.p. The rat was sacrificed 6 weeks after KA administration, and the rat brain was removed and was sliced. The Timm' s stain was performed for mossy fiber sprouting, the glial fibrillary acidic protein (GFAP) immunohistochemistry stain for astrocyte, and NeuN imunohistochemistry stain for neuronal cells.

Results :

The results indicated that the optical density (OD) of mossy fiber sprouting in the hippocampus region increased 6 weeks after KA administration; the OD of mossy fiber sprouting was not significantly difference between control group without GE treatment and GE-treated group; The increase of GFAP positive staining cells was greater in the control group than in the normal group without KA administration, whereas this increase was reduced by GE treatment; The decrease of NeuN positive staining cells was greater in the control group than in normal group, whereas this decrease was increased by GE treatment.

Conclusion :

In conclusion, although the GE treatment for 6 weeks cannot prevent the development of mossy fiber sprouting in KA-treated rat, the GE treatment can increase neuronal cells and decreases astrocytes simultaneously; suggesting GE plays a neuro-protection in KA-induced chronic epileptic rat model.

Keywords:

Gastrodia Elata; Neuro-protection; Kainic acid, Chronic epileptic seizure