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conferred by EPO-TAT, suggesting that these two protective pathways worked in parallel.

Conclusion: our study indicates parallel participation of AKT and ERK pathways in the protective mechanisms of EPO.

LUTEIN ENHANCES SURVIVAL AND REDUCES NEURONAL DAMAGE IN CEREBRAL AND RETINAL ISCHEMIA/REPERFUSION INJURY

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Purpose: Stroke is one of the leading causes of death worldwide. Protective agents that could diminish the injuries induced by cerebral ischemia/reperfusion (I/R) are crucial to alleviate the detrimental outcome of stroke. Retinal I/R also occurs in many ocular diseases and leads to neuronal death and therefore blindness. Lutein, a safe and potent antioxidant, is known to protect the retina in age-related macular degeneration. The aim of this study is to investigate the protective roles of lutein in cerebral and retinal I/R injury.

Methods: Two-hour cerebral ischemia was induced by unilateral middle cerebral artery occlusion (MCAo) in mice. Either lutein (0.2mg/kg) or vehicle was given to mice intraperitoneally 1hr after MCAo and 1hr after reperfusion. Neurological deficits were evaluated at 22hr after reperfusion while survival rate was assessed daily until 7 days after reperfusion. Flash electroretinogram (flash ERG) was taken to assess retinal function. After sacrifice, mouse brains were cut into 2mm-thick coronal slices and stained with 2% 2,3,5-triphenyltetrazolium chloride to determine the infarct size after MCAo. Eyes were also enucleated. Paraffin-embedded brain and retinal sections were prepared for TUNEL assay and immunohistochemistry. Protein lysate was collected for Western blotting experiments. Lutein's effect on Müller cells was further evaluated using a model of cobalt chloride-induced hypoxia in immortalized rat Müller cells (rMC-1).

Results: Higher survival rate, better neurological scores, smaller infarct area and smaller infarct volume were noted in the lutein-treated group. Immunohistochemistry data showed a decrease of immunoreactivity of nitrotyrosine, poly(ADP-ribose) and NFkB in the lutein-treated brains. Western blotting data showed decreased levels of Cox-2, pERK, and pIkB, but increased levels of Bcl-2, heat shock protein 70 and pAkt in the lutein-treated brains. In the retina, severe cell loss in retinal ganglion cell (RGC) layer was noted after I/R injury. Increased oxidative stress was observed in the injured retina. Lutein treatment protected RGC as well as decreased oxidative stress in I/R retina. Lutein treatment also minimized the deterioration of b-wave/a-wave ratio and oscillatory potentials in flash ERG as well as inhibited the up-regulation of GFAP in retinal I/R injury. In the cultured Müller cells, lutein treatment reduced level of nuclear NF-kB together with decreased levels of IL-1b and Cox-2.

Conclusions: Post-treatment of lutein protected both the brain and retina from I/R injury. The neuroprotective effect of lutein was associated with reduced oxidative stress. Less production of pro-inflammatory factors from Müller cells suggested an anti-inflammatory role of lutein in retinal ischemic/hypoxic injury. Our results suggest that lutein could diminish the deleterious outcomes of cerebral and retinal I/R probably by its anti-apoptotic, anti-oxidative and anti-inflammatory properties. Lutein may have a therapeutic role in protecting the brain in stroke and inner retina in eye diseases with acute ischemia.

REPETITIVE HYPOXIC PRECONDITIONING AMELIORATES COGNITIVE IMPAIRMENT AND WHITE MATTER LESIONS COGNITIVE IMPAIRMENT AND WHITE MATTER LESIONS

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Background and purpose: Neuroprotective effects of hypoxic preconditioning have been demonstrated in the transient focal ischemia-reperfusion injury. This study aims to verify the ameliorated effect of repetitive normobaric