عنوان مقاله:

Selegiline acts as neuroprotective agent against methamphetamine-prompted mood and cognitive related behavior and neurotoxicity in rats: Involvement of CREB/BDNF and Akt/GSK3 signal pathways

محل انتشار:

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خلاصه مقاله:

Objective(s): Present study investigated the neuroprotective effects of selegiline and the molecular mechanisms involved in methamphetamine-induced neurotoxicity.Materials and Methods: Male wistar rats were randomly divided into six groups (10 rats in each group). Group 1 and group 2 received normal saline and methamphetamine (10 mg/kg), respectively. Groups 3, 4, 5 and 6 were treated simultaneously with methamphetamine and selegiline. From day 22 to day 28, forced swim test, elevated plus maze, and open field test were conducted to assess mood (anxiety and depression) levels, and from day 17 to day 21, Morris Water Maze was conducted for cognition assessment. On day 29, hippocampus of the animals were isolated and evaluated by ELISA method for oxidative, antioxidant, and inflammatory factors and expression levels of active (total) and inactive (phosphorylated) forms of cyclic AMP response element binding protein (CREB), brain-derived neurotrophic factor (BDNF), Akt (Protein Kinase B) and glycogen synthase kinase 3 (GSK3) proteins. Results: Selegiline reduced behavioral impacts caused by methamphetamine in all doses. Methamphetamine administration may improve malondialdehyde, tumor necrosis factor-alpha, interleukin-1 beta and GSK3 (both forms). Moreover, methamphetamine reduced the activity of superoxide dismutase, glutathione peroxidase, glutathione reductase, amount of BDNF, CREB and Akt (both forms).Conclusion: Current research showed that selegiline can protect the brain from methamphetamine-prompted neurodegeneration, and this could be intervened by CREB -BDNF or Akt-GSK3 signaling pathways.

کلمات کلیدی:

Anxiety, Depression, Methamphetamine, Neurotoxicity, Selegiline