Acalypha indica Linn root extract improved hippocampal cell viability and increased Brain-derived Neurotrophic Factor (BDNF) in hypoxic condition

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Abstrak

Latar belakang: Penelitian ini dilakukan untuk mengetahui pengaruh pemberian ekstrak akar Acalypha indica Linn (akar kucing) dalam memproteksi neuron kultur jaringan hipokampus tikus pada keadaan hipoksia.
Metode: Ini merupakan penelitian eksperimental in vitro pada kultur primer sel hipokampus tikus Sprague Dowley dewasa. Selain kelompok kontrol, sel dipajan ekstrak Acalypha indica Linn dosis 10 mg/mL, 15 mg/mL, dan 20 mg/mL selama 72 jam. Kemudian seluruh kelompok sel diberi perlakuan hipoksia dengan gas-gas 5% O2 5% CO2 N2 balans selama 24 jam. Setelah itu viabilitas relatif sel diukur dengan 3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazolium bromide (MTT), 5-bromo2?-deoxy-uridine (BrdU) untuk proliferasi sel dan Brain-derived Neurotrophic Factor (BDNF) kit metode ELISA untuk kadar BDNF.
Hasil: Viabilitas sel hipokampus yang terpapar ekstrak akar Acalypha indica Linn pada pemeriksaan MTT (C: 99,7%, A indica L10: 326,3%, A indica L 15: 411,7%, A indica L 20: 445,9%), BrdU absorbansi (C: 0,07, A indica L 10: 0,10, A indica L 15: 0,12, A indica L 20: 0,13), meningkat secara bermakna dibandingkan kontrol ($p < 0,01$) disertai peningkatan kadar BDNF (C: 11,3 pg/mL, A indica L 10: 12,5 pg/mL, A indica L 15: 23,1 pg/mL, A indica L 20: 18,1 pg/mL).
Kesimpulan: Ekstrak akar Acalypha indica Linn mampu meningkatkan viabilitas sel hipokampus dan kadar BDNF endogen pada keadaan hipoksia.
<hr>Background: This study was done to determine the effect of root extract of Acalypha indica Linn (akar kucing) in protecting neuron viability of the rat hippocampus on tissue culture in hypoxic condition.
Methods: This is an experimental study of in vitro primary cell culture of hippocampus of Sprague Dowley adult rat. The cultures were group into control (C) and exposure to root extract of Acalypha indica Linn with dose of 10 mg/mL, 15 mg/mL, and 20 mg/mL for 72 hours. The cultures were then exposed to hypoxic gas (5% oxygen, 5% carbondioxide, nitrogen balance) for 24 hours. After that, relative cell viability was measured by 3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazolium bromide (MTT), cell proliferation by 5-bromo2?-deoxy-uridine (BrdU), and Brain-derived Neurotrophic Factor (BDNF) levels by BDNF ELISA kit.
Results: The result showed MTT viability (C: 99.7%, A indica L 10: 326.3%, A indica L 15: 411.7%, A indica L 20: 445.9%), BrdU absorbance (C: 0.07, A indica L 10: 0.10, A indica L 15: 0.12, A indica L 20: 0.13) of the exposured hippocampal cell were significantly higher than the control group ($p < 0.01$) accompany by increased level of BDNF (C: 11.3 pg/mL, A indica L 10: 12.5 pg/mL, A indica L 15: 23.1 pg/mL, A indica L 20: 18.1 pg/mL).
Conclusion: The root extract of Acalypha indica Linn is able to improve rat hippocampal cell viability and endogenous BDNF levels in hypoxic condition.