

The nerve protection and in vivo therapeutic effect of *Acalypha indica* extract in frogs

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Abstrak

Tujuan Membuktikan efek neuroproteksi dan/atau neuroterapi ekstrak air *Acalypha indica* Linn. pada katak yang dilumpuhkan dengan injeksi pankuronium bromida Metode Enam puluh ekor katak (*Bufo melanostictus* Schneider) dibagi ke dalam dua kelompok perlakuan yaitu kelompok neuroproteksi dan neuroterapi. Setiap kelompok dibagi ke dalam 6 subkelompok yaitu kontrol negatif (diberi air); kontrol positif (pirasetam), dan 4 kelompok dosis ekstrak: 200, 300, 400, 500 mg/KgBB. Pankuronim bromida 0,2 %, pelumpuh otot, disuntikkan subkutan pada punggung katak. Untuk efek proteksi, ekstrak diberikan per oral 1 jam sebelum disuntik, sedangkan untuk efek terapi ekstrak diberikan, sepuluh menit sesudah penyuntikan pankuronium bromida. Parameter yang diukur adalah waktu (menit) timbul dan lama kelumpuhan, serta waktu untuk perbaikan. Hasil penelitian menunjukkan bahwa pada dosis ekstrak 400 dan 500 mg/KgBB terjadi efek neuroproteksi yang berbeda bermakna dibanding kontrol negatif dan pirasetam ($p < 0.05$). Ekstrak pada dosis 200-500 mg/KgBB menunjukkan efek neuroterapi yang berbeda bermakna dibandingkan kontrol negatif ($p = 0.000$) dan tidak berbeda bermakna dibandingkan pirasetam, kecuali pada dosis ekstrak 300 mg/KgBB, menunjukkan efek lebih baik dibandingkan dengan pirasetam ($p = 0.012$). Kesimpulan Bahwa ekstrak air *Acalypha indica* Linn. memiliki efek neuroproteksi dan neuroterapi yang sama atau lebih baik dibandingkan pirasetam pada katak yang dilumpuhkan dengan pankuronium bromida. Namun, masih diperlukan uji farmakodinamik dan farmakokinetik pada dua model hewan coba yang lazim digunakan.

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Abstract

Aim To demonstrate nerve protection and/or treatment effect of *Acalypha indica* Linn. extract on nerve paralysis induced by subcutaneous injection of pancuronium bromide on frog's back. Methods The study was performed on sixty frogs (*Bufo melanostictus* Schneider) that divided into two groups, i.e. the neuro-protection and neuro-therapy group. Each group was divided further into 6 sub-treatment groups: negative control group treated by water and positive control group treated by piracetam, treatment groups received the extracts 200, 300, 400, 500 mg/kgBW. Pancuronium bromide 0.2% (1 : 20 dilutions) were injected subcutaneously as muscle relaxant. The protective effect was studied by giving the extract orally, 1 hour prior to injection; while the therapeutic effect of the extract was studied by 10 minute treatment after injecting pancuronium bromide solution. The parameters measured were the onset and duration of paralysis (in minutes) and the recovery time (time needed to recover into normal condition). Results The study showed significantly different protective effect of *Acalypha indica* Linn. root water extract at 400 and 500 mg/Kg.BW compared to negative control group and positive control group (piracetam ($p < 0.05$); while the therapeutic effect was obvious at the dose 200-500 mg/Kg.BW compared to negative control group ($p = 0.000$). There was no significant difference compared to positive control group (piracetam), except at 300 mg/Kg.BW ($p = 0.012$). Conclusion These results have proven that the water extract of *Acalypha indica*

Linn. root has comparable protective and treatment effect on nerves system, as piracetam, but further studies should be performed to provide more evidences particularly pharmacokinetic and pharmacodynamic studies on two animal models that commonly used.