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**Pengaruh Neuroprotektif Ekstrak Cinnamomum verum terhadap Escape Latency, BDNF, TrkB, dan Histologi
Hipokampus pada Tikus Model Cerebral Ischemia Reperfusion Injury**
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INTISARI

Penggunaan fibrinolitik untuk stroke iskemia dapat menyebabkan *cerebral ischemia-reperfusion injury* (CIRI) dan *post-stroke cognitive impairment* (PSCI). Otak mengompensasi dengan *brain-derived neurotrophic factor* (BDNF) dan *tropomyosin receptor kinase B* (TrkB), tetapi CIRI menghalangi interaksi keduanya. *Cinnamomum verum* diketahui bersifat neuroprotektif, tetapi belum ada penelitian *C. verum* terhadap BDNF dan TrkB pada CIRI. Studi ini mengeksplor potensi neuroprotektif *C. verum* terhadap ekspresi BDNF dan TrkB, gambaran hipokampus, serta fungsi memori pada model CIRI. Penelitian dilaksanakan secara *in vivo* yang dimulai dari ekstraksi dan uji fitokimia *C. verum*. Hewan uji tikus dibagi menjadi lima kelompok (SO, BCCAO, C100, C200, dan C400). Tikus diinduksi CIRI menggunakan metode *Bilateral Common Carotid Artery Occlusion* (BCCAO). Setelah itu, tikus diadministrasikan ekstrak *C. verum* per oral dengan tiga dosis, yaitu 100, 200, dan 400 mg/kg. Dilakukan uji fungsi memori *Morris water maze* (MWM) dinilai dari *escape latency* dan kecenderungan area berenang. Setelah hewan dikorbankan, diambil sampel otak untuk pewarnaan hematoksilin-eosin serta uji ekspresi BDNF dan TrkB dengan *Reverse Transcriptase-Polymerase Chain Reaction* (RT-PCR). Seluruh data dianalisis menggunakan SPSS, dengan ketentuan: data berdistribusi normal dan homogen dianalisis dengan ANOVA dan LSD; data berdistribusi normal dan tidak homogen dianalisis dengan ANOVA dan Dunnett's T3; data berdistribusi tidak normal dan tidak homogen maupun homogen dianalisis dengan Kruskal-Wallis dan *Dunn's Test*. Data dianggap berbeda signifikan ketika nilai $p<0,05$. *Escape latency* serta ekspresi BDNF dan TrkB kelompok *C. verum* tidak berbeda signifikan daripada kelompok BCCAO secara statistik ($p>0,05$), tetapi tren pada grafik sebenarnya menunjukkan adanya potensi aktivitas neuroprotektif dari *C. verum* melalui kecenderungan penurunan *escape latency* serta peningkatan BDNF dan TrkB. Histologi hipokampus kelompok *C. verum* terlihat lebih baik daripada BCCAO secara kualitatif. Oleh karena itu, *C. verum* berpotensi untuk memiliki efek neuroprotektif sebagai alternatif terapi CIRI melalui peningkatan ekspresi BDNF dan TrkB, fungsi memori, dan morfologi hipokampus.

Kata kunci: **CIRI, PSCI, BDNF, TrkB, *Cinnamomum verum***

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ABSTRACT

The use of fibrinolytics for ischemic stroke can cause cerebral ischemia-reperfusion injury (CIRI) and post-stroke cognitive impairment (PSCI). The brain compensates it with brain-derived neurotrophic factor (BDNF) and tropomyosin receptor kinase B (TrkB), but CIRI blocks their interaction. Cinnamomum verum is known to be neuroprotective, but there have been no studies of C. verum effects to BDNF and TrkB in CIRI. This study explored the neuroprotective potential of C. verum against BDNF and TrkB expression, hippocampus morphology, and memory function in CIRI model. The research was carried out in vivo starting from extraction and phytochemical screening of C. verum. Rats were divided into five groups (SO, BCCAO, C100, C200, and C400). CIRI was induced using Bilateral Common Carotid Artery Occlusion (BCCAO) method. Rats were administered with C. verum extract orally with three doses: 100, 200, and 400 mg/kg. The Morris water maze (MWM) memory test was done to assess escape latency and swimming area tendency. After the sacrifice, brain samples were taken for hematoxylin-eosin staining and BDNF and TrkB expression tests with Reverse Transcriptase-Polymerase Chain Reaction (RT-PCR). All data were analyzed using SPSS, with the following conditions: normal and homogeneously distributed data were analyzed with ANOVA and LSD; normally distributed and non-homogeneous data were analyzed with ANOVA and Dunnett's T3; abnormal and non-homogeneous or homogeneous distributed data were analyzed with Kruskal-Wallis and Dunn's Test. The data are significantly different when $p<0.05$. Escape latency and BDNF and TrkB expression of C. verum group did not differ statistically from the BCCAO group ($p>0.05$), but the trend shows potential for neuroprotective activity of C. verum through the decrease of escape latency and an increase in BDNF and TrkB. Therefore, C. verum has the potential to have neuroprotective effects as CIRI therapy through improved BDNF and TrkB expression, memory function, and hippocampal morphology.

Keywords: **CIRI, PSCI, BDNF, TrkB, *Cinnamomum verum***