UNIVERSITI TEKNOLOGI MARA

EXPLORING POTENTIAL NEUROPROTECTIVE PROPERTIES OF *Centella asiatica* AQUEOUS EXTRACT ON CHRONIC STRESS-INDUCED RATS

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ABSTRACT

Centella asiatica is one of the traditional herbs consumed by various communities due to its versatility and wide range of applications such as treatment for Parkinsonism, promoting memory enhancement and preventing oxidative stress. This study investigates the neuroprotective potential of *Centella asiatica* extract (CAE) against neurodegeneration induced by chronic stress. Forty adult Wistar rats were divided into five groups: Normal (NC), positive control (PC), CAE 200 (200 mg/kg/day), CAE 400 (400 mg/kg/day) and CAE 800 (800 mg/kg/day). Rats from respective groups were administered accordingly to respective dosages for a period of 21 days along with exposure to chronic stress by restrainer and forced swimming. The administration of CAE over a period of 21 days showed no apparent toxicity or morbidity in chronic stress-induced rats. The blood serum biochemical and haematological parameters showed no significant changes in groups supplemented with CAE with comparison to normal group ($p>0.05$) and the values were within normal physiological range. The administration of CAE at three different dosages showed significant neurogenesis activities through apparent thickening of dentate gyrus, improved neuroproliferation and reduced neuronal cell death ($p<0.05$). The significant improvement in neurogenesis activities was reflected by significant elevation of c-fos protein expression in hippocampus of rats administered with CAE ($p<0.05$). The neuroprotective potential of CAE was further assessed through metabolic patterns in blood serum, which demonstrated a significant elevation of lactate, isoleucine, proline, methionine, valine, leucine and glutamine ($p<0.05$). The chronic stress-induced rats showed apparent distinction between CAE-administered groups and PC through PCA and PLS-DA analyses, as well as recovery shifting pattern towards normal group. Overall, these results suggested that CAE possess positive neuroprotective potential that can promote neurogenesis activities and reduce neuronal cell damage in chronic stress-induced rats.

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