

ABSTRACT

Mechanism of Ethanol Extracts of *Centella asiatica* herbs in enhancing Apoptosis of alveolar macrophages from rats lung tissue infected by *Mycobacterium tuberculosis*

Mycobacterium tuberculosis has capacity to manipulate host defense pathway, particularly the ability to inhibit apoptosis of infected host cells. *Centella asiatica* is a medicinal plant which is able to reduce growth of *Mycobacterium tuberculosis* and enhance the cellular immune response and apoptosis in cancer cells. The aim of this research is to determine the effect and mechanism of the ethanol extract of *Centella asiatica* herbs in enhancing apoptosis of alveolar macrophages from rat lung tissue that has been infected by *Mycobacterium tuberculosis*.

The research method is an experimental laboratory in. Thirty five male rats were infected by *Mycobacterium tuberculosis* using intratrachea method and they were divided randomly into 5 groups. Group 1, 2, and 3 were given ethanol extracts of *Centella asiatica* herbs at 375mg/KgBW, 750mg/KgBW, 1500mg/KgBW, daily for 14 days. The fourth group were not given ethanol extract of *Centella asiatica* herbs. The fifth group were terminate at 28 days after infected by *Mycobacterium tuberculosis*. Apoptosis, expression of Bcl 2, Bax, Caspase 8 and antigen of *Mycobacterium tuberculosis* were performed by using immunohistochemistry. The bacillary loads were evaluated by culture in Middlebrook 7H10. The damaging of rats lung tissue were analyzed by histopathological.

The results have shown that the ethanol extract of *Centella asiatica* herbs were able to reduce expression of Bcl-2 and antigen of *Mycobacterium tuberculosis*, increase expression of Bax, increase expression of Caspase 8 and enhance the apoptosis of alveolar macrophages in rats lung tissue infected by *Mycobacterium tuberculosis*. Ethanol extract of *Centella asiatica* herbs have decreased the number of *Mycobacterium tuberculosis* and reduced lung tissue damage of rats infected by *Mycobacterium tuberculosis*.

In conclusion, the ethanol extract of *Centella asiatica* herbs have active ingredients to enhance of apoptosis alveolar macrophages from rat lung tissue that were infected by *Mycobacterium tuberculosis* through increasing of Caspase 8's expression, Bax'expression and decreasing of Bcl-2's expression. The effect of ethanol extract of *Centella asiatica* herb is a chain reaction that occurs in various stages until decrease the bacillary load of *Mycobacterium tuberculosis* and reduce rats lung tissue damage.

Key words : Extracts ethanol of *Centella asiatica*, *Mycobacterium tuberculosis*, macrophages, apoptosis, rats lung tissue