Eupatorin suppressed tumour progression and enhanced immunity in a 4T1 murine breast cancer model

ABSTRACT

Eupatorin is a polymethoxy flavone extracted from Orthosiphon stamineus and was reported to exhibit cytotoxic effects on several cancer cell lines. However, its effect as an anti–breast cancer agent in vivo has yet to be determined. This study aims to elucidate the potential of eupatorin as an anti–breast cancer agent in vivo using 4T1 challenged BALB/c mice model. In this article, BALB/c mice (20-22 g) challenged with 4T1 cells were treated with 5 mg/kg or 20 mg/kg eupatorin, while the untreated and healthy mice were fed with olive oil (vehicle) via oral gavage. After 28 days of experiment, the mice were sacrificed and blood was collected for serum cytokine assay, while tumors were harvested to extract RNA and protein for gene expression assay and hematoxylin-eosin staining. Organs such as spleen and lung were harvested for immune suppression and clonogenic assay, respectively. Eupatorin (20 mg/kg) was effective in delaying the tumor development and reducing metastasis to the lung compared with the untreated mice. Eupatorin (20 mg/kg) also enhanced the immunity as the population of NK1.1+ and CD8+ in the splenocytes and the serum interferon-γ were increased. Concurrently, eupatorin treatment also has downregulated the expression of pro-inflammatory and metastatic related genes (IL-1β. MMP9, TNF-α, and NF-κB). Thus, this study demonstrated that eupatorin at the highest dosage of 20 mg/kg body weight was effective in delaying the 4T1-induced breast tumor growth in the animal model.

Keyword: 4T1; Clonogenic; Eupatorin; MMP-9; NF-κB; NK1.1; CD8