www.impactjournals.com/oncotarget/ Oncotarget, 2017, Vol. 8, (No. 7), pp: 11621-11628

Research Paper

Matrine alleviates lipopolysaccharide-induced intestinal inflammation and oxidative stress via CCR7 signal

Guojun Wu[1,*], Wenhong Zhou[2,*], Junfeng Zhao[3], Xiaohua Pan[1], Yongjie Sun[1], Hao Xu[1], Peng Shi[1], Chong Geng[1], Ling Gao[4], Xingsong Tian[1]

[1]Department of Breast and Thyroid Surgery, Shandong Provincial Hospital Affiliated to Shandong University, Jinan 250021, Shandong, P. R. China

[2]Department of Nursing, Shandong Provincial Hospital Affiliated to Shandong University, Jinan 250021, Shandong, P. R. China

[3]Traffic Police Department, Jinan Public Security Bureau, Jinan 250021, Shandong, P. R. China

[4]Scientific Center, Shandong Provincial Hospital Affiliated to Shandong University, Jinan 250021, Shandong, P. R. China

[*]These authors contributed equally to this work

Correspondence to: Ling Gao, **email:** gaoling8822@sina.com
Xingsong Tian, **email:** xingsong_tianxs@sina.cn

Keywords: *matrine, inflammation, oxidative stress, CCR7, LPS*

Received: *December 10, 2016* ***Accepted:*** *December 27, 2016* ***Published:*** *January 11, 2017*

ABSTRACT

The aim of this study was to investigate the protective effects of matrine on lipopolysaccharide (LPS)-induced inflammation and oxidative stress *in vivo* and *in vitro*. The results showed that matrine improved intestinal inflammatory status and oxidative balance and enhanced chemokine receptor 7 (CCR7) expression. In LPS-challenged mice and Caco-2 cells, matrine alleviated LPS-induced inflammation and oxidative stress via downregulating pro-inflammatory cytokines (IL-1β and IL-17) and malondialdehyde (MDA) production. CCR7-siRNA transfection blocked the protective effects of matrine on LPS-induced inflammation and oxidative stress and exacerbated LPS caused injury. In conclusion, matrine alleviates LPS-induced intestinal inflammation and oxidative stress in mice and Caco-2 cells, which may be associated with CCR7 signal.

INTRODUCTION

Matrine, a quinolizidine alkaloid component of the Chinese herb, isolates from the roots of Sophora species, such as Sophora flavescens (Kushen), Sophora tonkinensis, and Sophora alopecuroides (Kudouzi) [1]. Various reports have suggested that matrine exhibits anti-inflammatory and antioxidant effects and may serve as a therapeutic potential for inflammation and oxidative stress relative diseases [2, 3]. For example, matrine alleviates cytokines production, inflammatory cell infiltration, and goblet cell differentiation by downregulating suppressor of cytokine signaling 3 and inhibiting nuclear factor kappa-B (NF-κB) signal in airway epithelial cells and asthmatic mice [4]. In the focal cerebral ischemic injury, matrine improves antioxidant activity via increasing antioxidant enzymes, such as superoxide dismutase (SOD), glutathione peroxidase (GSH-Px), and catalase (CAT) [5]. Furthermore, matrine and its derivatives have displayed anticancer activity, antiviral activity, analgesic effect, anti-fibrotic activity, insecticidal activity, and antimicrobial activity [1].

Chemokine receptors (CCR) and their ligands play an important role in coordination of cell trafficking in many biological processes, especially for inflammation and oxidative stress [6]. However, there are little references about matrine and chemokine receptors mediated inflammation and oxidative stress. Thus, in this study, we used lipopolysaccharide (LPS) to induce inflammation and oxidative stress in mice and Caco-2 cells to investigate the protective role of matrine in LPS-induced inflammation and oxidative stress and the potential mechanism of chemokine receptors.