F-15

Ma-Xing-Shi-Gan-Tang, a traditional Chinese medicine, attenuates lipopolysaccharide-induced pulmonary microcirculatory disturbance and lung edema in rats

Li-Qian Ma^{1,2)}, Kai Sun¹⁾, Chun-Shui Pan¹⁾, Yu-Ying Liu¹⁾, Li Yan¹⁾, Jing-Yu Fan¹⁾, Jing-Yan Han^{1,2)}

1) Tasy Microcirculation Research Center, Peking University Health Science Center, Beijing 100191, China

2) Department of Integration of Chinese and Western Medicine, School of Basic Medical Sciences, Peking University, Beijing 100191, China

Background: Ma-Xing-Shi-Gan-Tang (MXSGT) is a compound traditional Chinese medicine which has been widely used in clinic for treatment of acute upper respiratory tract infection in China. However, whether MXSGT could improve LPS-induced pulmonary microcirculatory disturbance and lung edema is still not clear.

Objective: The aim of this study is to investigate the ameliorating effect and potential mechanism of MXSGT on the LPS-induced pulmonary microcirculatory disturbance and lung edema.

Method: Male Sprague-Dawley rats (weight in 200 ± 20 g) were injected with LPS (7mg/kg) intraperitoneally to induce lung microcirculatory disturbance and lung edema. MXSGT (2.6075g/kg) was given by gavage 6 hours after LPS exposure. Examinations were undertaken at 6 and 12 hours after LPS exposure, respectively.

Result: The number of leukocytes adhering to pulmonary venules and the expression of ICAM-1 in lung tissue were increased at 6 hours and 12 hours after LPS exposure. In addition, LPS increased pulmonary tissue W/D ratio and decreased the expression of junctional adhesion molecule-1 and claudin-5 in lung tissue. Post-treatment with MXSGT significantly suppressed these changes induced by LPS exposure.

Conclusion: This study demonstrated that MXSGT ameliorated rat pulmonary microcirculation disturbance and lung edema induced by LPS, the underlying mechanism may involve protection of leukocytes from adhering to pulmonary venule and up-regulation of junctional adhesion molecule-1 and claudin-5 in lung tissue.

F-16

The protective effects of rapamycin on intestinal ischemia/reperfusion induced remote lung injury in mice

Takaya Iida¹⁾, Yuji Naito¹⁾, Tomohisa Takagi¹⁾, Kazuhiro Katada¹⁾, Katsura Mizushima¹⁾, Kazuhiro Kamada¹⁾, Kazuhiko Uchiyama¹⁾, Osamu Handa¹⁾, Nobuaki Yagi¹⁾, Yoshito Ito¹⁾, Toshikazu Yoshikawa²⁾

1) Department of Molecular Gastroenterology and Hepatology, Graduate School of Medical Science, Kyoto Prefectural University of Medicine

2) Kyoto Prefectural University of Medicine

Introduction: The intestinal ischemia/reperfusion (I/R) injury occurs in various clinical settings, such as mesenteric artery occlusion, trauma, and intestinal transplantation. Intestinal I/R injury elicits inflammatory responses within the intestine, including mucosal epithelial cell damage, loss of barrier function, proinflammatory cytokine production, and increased microvascular permeability. These changes develop multiple organ failure, and become fatal. However, the cure is not fully established. The mammalian target of rapamycin (mTOR) plays an important role in cellular proliferation and survival. It has been shown to be focused on a therapeutic target for various diseases such as cancer and inflammation. Herein, this study was designed to determine whether the mTOR inhibitor, rapamycin, had protective effects on intestinal I/R injury in mice.

Methods: The small intestine of C57BL/6 mice was challenged with ischemia by occluding superior mesenteric artery for 1h. Rapamycin was administered intraperitoneally 1h before the induction of ischemia. In mice following intestinal I/R, the survival rate, inflammatory responses and adhesion molecules in the small intestine and lung were assessed. Bacterial cultures were performed using the homogenate samples from lungs. Phagocytic capacity in the alveolar macrophages and the activation of NF- κ B in the lung were also assessed.

Results: Treatment with rapamycin significantly improved survival rate after intestinal I/R. Inflammatory markers (TNF-alpha and MPO activity) in the intestinal tissue of rapamycin-treated mice were unchanged but these assays in the lung were attenuated in rapamycin-treated mice along with decreased bacterial culture and increased phagocytic capacity. The activation of NF- κ B and downstream expression of adhesion molecules in the lung of rapamycin-treated mice were downregulated.

Conclusion: Treatment with rapamycin improved survival rate via attenuation of intestinal I/R-induced remote lung injury.