Triptolide down-regulates tumor necrosis factor-a and interferon-g-induced overexpression of monocyte chemoattractant protein-1 in human proximal tubular epithelial cells

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Objective: Triptolide is the major active component of Tripterygium wilfordii Hook. f., which has been used as an anti-inflammatory agent in traditional Chinese medicine for centuries. The mechanisms of the anti-inflammatory effects of triptolide in renal diseases are not well understood. Recent studies have shown that overexpression of monocyte chemoattractant protein-1 in renal tubular epithelial cells is associated with the inflammatory injuries of renal tubulointerstitium. In this study, we investigated the effect of triptolide on the overexpression of monocyte chemoattractant protein-1 in renal tubular epithelial cells in vitro.

Methods: Human proximal tubular epithelial cells were treated with gamma interferon (200 µg/L) and tumor necrosis factor-alpha (20 µg/L) or combined with different concentrates of triptolide (0.4, 2, 10 µg/L) for 12 hours (for monocyte chemoattractant protein-1 mRNA measuring) or 24 hours (for monocyte chemoattractant protein-1 protein measuring). The expression of monocyte chemoattractant protein-1 mRNA was detected by using reverse transcriptase-polymerase chain reaction. The expression of monocyte chemoattractant protein-1 protein in the cells was measured by using flow cytometry. Monocyte chemoattractant protein-1 levels in the supernatant were measured by using the enzyme-linked immunosorbent assay method.

Results: After treatment with interferon-g and tumor necrosis factor-a, monocyte chemoattractant protein-1 mRNA and protein levels in human proximal tubular epithelial cells and monocyte chemoattractant protein-1 concentrations in the supernatant were significantly increased. Triptolide (10 µg/L) can significantly inhibit the overexpression of monocyte chemoattractant protein-1 mRNA and protein in human proximal tubular epithelial cells. The increase of monocyte chemoattractant protein-1 protein in the supernatant was also markedly inhibited by triptolide (2, 10 µg/L).

Conclusions: The results of this study suggest that the inhibition of monocyte chemoattractant protein-1 overexpression in tubular epithelial cells may contribute to the anti-inflammatory effects of triptolide in renal diseases. (Hong Kong J Nephrol 2002;4(1):29-32)

Key words: Epithelial cells/immunology, Enzyme-linked immunosorbent assay, Kidney tubules/pathology, Nuclear factor-kappaB (NF-kB), Triptolide