Effect of Glucocorticoid on the MUC4 Gene in Nasal Polyps

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Introduction

Among the airway mucin genes, the MUC4 gene is an important gene in its response to inflammatory diseases of the upper airway. However, the expression and regulation of the MUC4 gene in the nasal polyps remains unclear.

The purpose of this study was to evaluate the expression of MUC4 mRNA and synthesis of mucin glycoprotein in the nasal polyps before and after treatment with a topical steroid in vivo and in vitro.

Materials & Methods

Nasal polyps were obtained from 20 patients with chronic rhinosinusitis and were subsequently cultured. The patients had not evidence of allergic rhinitis, asthma and recent acute exacerbation. All patients stopped oral and topical corticosteroids, and antibiotics for at least four weeks prior to surgery.

The level of MUC4 mRNA was measured by reverse-transcription polymerase chain reaction, and the amount of the MUC4 mucin glycoprotein was estimated by the enzyme-linked immunosorbent assay. The statistic analysis was performed using Student t-test.

Results

The expression of MUC4 mRNA was found to be significantly higher in the nasal polyps than in the inferior turbinate (p<0.05, Fig. 1).

The addition of interleukin (IL)-1β and lipopolysaccharide (LPS) increased the expression of MUC4 mRNA and MUC4 glycoprotein synthesis in cultured nasal polyp epithelial cells (Fig. 2).

Treatment with glucocorticoid inhibited the expression of MUC4 mRNA in the nasal polyps (Fig. 3); it also inhibited the expression of IL-1β and LPS-induced MUC4 mRNA and MUC4 glycoprotein synthesis in cultured nasal polyp epithelial cells. The inhibitory effects of glucocorticoid were restored by treatment with RU-486, a glucocorticoid receptor antagonist (Fig. 4).

Conclusion

These results suggest that the MUC4 gene is one of the important mucin genes expressed in the nasal polyps and that glucocorticoid can control the expression of MUC4 genes and mucin glycoprotein synthesis.