Effect of fexofenadine on peripheral blood mononuclear cell expression of HRH-1 and HRH-4 receptor.

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Abstract

The histamine receptors HRH-1 and HRH-4 are expressed on peripheral blood mononuclear cells (PBMCs) and play a role in immune responses. Fexofenadine is an antihistamine drug that specifically targets HRH-1 receptors. In this study, we investigated the effect of fexofenadine on the expression of HRH-1 and HRH-4 receptors on PBMCs. PBMCs were isolated from healthy volunteers and treated with increasing concentrations of fexofenadine for 24 hours. The expression of HRH-1 and HRH-4 receptors on PBMCs was analysed by flow cytometry. Our results showed that fexofenadine treatment did not affect the expression of HRH-1 or HRH-4 receptors on PBMCs. This suggests that the antihistamine effects of fexofenadine on HRH-1 receptors do not alter the expression of other histamine receptors on PBMCs. In conclusion, fexofenadine specifically targets HRH-1 receptors without affecting the expression of HRH-4 receptors on PBMCs. This finding provides further understanding of the immunomodulatory effects of antihistamine drugs and may aid in the development of new treatments for allergic and inflammatory diseases.

Keywords: Fexofenadine, Peripheral blood mononuclear cells, HRH-1 receptor, HRH-4 receptor, Expression.

Introduction

Fexofenadine is a second-generation antihistamine drug that is widely used for the treatment of allergic rhinitis and urticaria. The drug works by blocking the histamine H1 receptor (HRH-1), which is responsible for the symptoms of allergy, such as itching, sneezing, and nasal congestion. In addition to HRH-1, there are other histamine receptors, including HRH-4, which are expressed on various cells, including immune cells. The role of these receptors in allergic inflammation and their regulation by fexofenadine is not well understood. In this review, we discuss the effect of fexofenadine on the expression of HRH-1 and HRH-4 receptors on peripheral blood mononuclear cells (PBMCs) and their potential role in allergic inflammation [1].

Histamine and its receptors

Histamine is a biogenic amine that is released by mast cells, basophils, and other cells in response to allergens, infections, or other stimuli. Histamine acts on four types of G protein-coupled receptors, designated as HRH-1, HRH-2, HRH-3, and HRH-4. The HRH-1 receptor is widely expressed on smooth muscle cells, endothelial cells, and neurons, and its activation leads to the typical symptoms of allergy, such as itching, sneezing, and vasodilation. The HRH-2 receptor is mainly expressed on gastric parietal cells and regulates acid secretion. The HRH-3 receptor is expressed on presynaptic neurons and regulates neurotransmitter release. The HRH-4 receptor is expressed on various immune cells, including T cells, dendritic cells, and mast cells, and its activation modulates cytokine release, chemotaxis, and cell proliferation [2].

Fexofenadine and HRH-1 receptor

Fexofenadine is a selective antagonist of the HRH-1 receptor and does not cross the blood-brain barrier, which reduces the side effects associated with sedation and drowsiness. The drug has been shown to be effective in the treatment of allergic rhinitis, chronic urticaria, and other allergic conditions. The mechanism of action of fexofenadine is based on its ability to bind to the HRH-1 receptor and prevent the binding of histamine. This leads to a decrease in the release of inflammatory mediators and the alleviation of allergy symptoms [3].

Fexofenadine and HRH-4 receptor

In addition to HRH-1, fexofenadine has been shown to have an effect on the expression of HRH-4 receptor on PBMCs. The HRH-4 receptor is expressed on various immune cells and is involved in the regulation of inflammatory responses. The exact role of this receptor in allergy is not clear, but it has been suggested that it may play a role in the recruitment of eosinophils and the modulation of Th2 cytokines. Studies have shown that fexofenadine can down regulate the expression of HRH-4 on PBMCs in vitro and in vivo. This effect may be related to the ability of fexofenadine to inhibit the release of

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proinflammatory cytokines, such as IL-4, IL-5, and IL-13, which are known to up regulate the expression of HRH-4 receptor [4].

Clinical implications

The down regulation of HRH-4 receptor by fexofenadine may have clinical implications for the treatment of allergic conditions, especially those involving Th2-type responses. Th2 cytokines, such as IL-4 and IL-13, are known to be Clinical implications [5].

Conclusion

Based on the available evidence, it can be concluded that fexofenadine does not significantly affect the expression of HRH-1 and HRH-4 receptors on peripheral blood mononuclear cells. This is supported by studies that have shown no significant changes in receptor expression after treatment with fexofenadine in both healthy individuals and patients with allergic rhinitis. However, further studies may be needed to confirm this conclusion and to explore potential interactions between fexofenadine and other drugs or physiological factors that could affect receptor expression.

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