Ribavirin or CpG DNA sequence modulated dendritic cells decrease IgE level and airway inflammation

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摘要

Abstract

Asthma is an allergic disease that is characterized by the imbalance between Th1 and Th2 cells and by the predominant Th2-type immune response. In this study, we investigated the application of dendritic cell (DCs)-based immunotherapy in modulating the immune response of allergic diseases. DCs incubated with ovalbumin (OVA), OVA plus ribavirin, OVA plus CpG-oligodeoxynucleotides (ODN 1826), or OVA plus non-CpG-ODN (ODN 1745) for 48 hours were injected intravenously into four corresponding groups of BALB/c mice. All of the mice were then immunized with OVA intraperitoneally 7 days later to establish an animal model of asthma. Serum levels of OVA antibody, airway hyperresponsivness, cell composition and cytokine levels in the bronchoalveolar lavage fluid, and cytokine profiles of spleen cells were analyzed. The data showed that ribavirin and ODN 1826 increased interleukin-12 synthesis and inhibited interleukin-10 production. ODN 1826 could also enhance the expression of B7.1, B7.2, major histocompatibility complex I, and major histocompatibility complex II molecules. Furthermore, the DCs modulated by ribavirin and ODN 1826 could downregulate the Th2-type immune response in vivo and could alleviate airway inflammation. This study elucidated the effect of ribavirin and CpG-ODN on DCs and demonstrated that in vitro modulated DCs might be a potential therapeutic approach for asthma.