

Children Asthma; The Role of Molecular Pathways and Novel Saliva Biomarkers Assay

Authors : Seyedahmad Hosseini, Mohammadjavad Sotoudeheian

Abstract : Introduction: Allergic asthma is a heterogeneous immuno-inflammatory disease based on Th-2-mediated inflammation. Histopathologic abnormalities of the airways characteristic of asthma include epithelial damage and subepithelial collagen deposition. Objectives: Human bronchial epithelial cell genome expression of TNF- α , IL-6, ICAM-1, VCAM-1, nuclear factor (NF)- κ B signaling pathways up-regulate during inflammatory cascades. Moreover, immunofluorescence assays confirmed the nuclear translocation of NF- κ B p65 during inflammatory responses. An absolute LDH leakage assays suggested LPS-induced cells injury, and the associated mechanisms are co-incident events. LPS-induced phosphorylation of ERK and JNK causes inflammation in epithelial cells through inhibition of ERK and JNK activation and NF- κ B signaling pathway. Furthermore, the inhibition of NF- κ B mRNA expression and the nuclear translocation of NF- κ B lead to anti-inflammatory events. Likewise, activation of SUMF2 which inhibits IL-13 and reduces Th2-cytokines, NF- κ B, and IgE levels to ameliorate asthma. On the other hand, TNF α -induced mucus production reduced NF- κ B activation through inhibition of the activation status of Rac1 and I κ B α phosphorylation. In addition, bradykinin B2 receptor (B2R), which mediates airway remodeling, regulates through NF- κ B. Bronchial B2R expression is constitutively elevated in allergic asthma. In addition, certain NF- κ B -dependent chemokines function to recruit eosinophils in the airway. Besides, bromodomain containing 4 (BRD4) plays a significant role in mediating innate immune response in human small airway epithelial cells as well as transglutaminase 2 (TG2), which is detectable in saliva. So, the guanine nucleotide-binding regulatory protein α -subunit, G α 16, expresses a κ B-driven luciferase reporter. This response was accompanied by phosphorylation of I κ B α . Furthermore, expression of G α 16 in saliva markedly enhanced TNF- α -induced κ B reporter activity. Methods: The applied method to form NF- κ B activation is the electromobility shift assay (EMSA). Also, B2R-BRD4-TG2 complex detection by immunoassay method within saliva with EMSA of NF- κ B activation may be a novel biomarker for asthma diagnosis and follow up. Conclusion: This concept introduces NF- κ B signaling pathway as potential asthma biomarkers and promising targets for the development of new therapeutic strategies against asthma.

Keywords : NF- κ B, asthma, saliva, T-helper

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