Review Article

Various Screening Methods for Anti-allergic Activity: An Overview

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ABSTRACT: Development of compounds having diverse antiallergic activities to be used in the treatment of various conditions like rhinitis, dermatitis, asthma, food allergies and pollensosis, requires screening methods with efficient reproducibility and perfection. In such process some series of steps were followed; Antiasthmatic and relative activities were performed on albino guinea pig and isolated trachea through sensitization of animals with well known antigens such as egg albumin and Bordetella pertussis vaccine. Bronchodilator activities for both compound and standard (aminophylline) against contraction were produced by standard agonists like acetylcholine, histamine and egg albumin. Bronchoprotective activities were performed against various mediators. Experiments on sensitized isolated ileum, mast cell stabilizing activities on rat mesenteries, homologous passive cutaneous anaphylaxis (PCA) using above mentioned antigens were followed. Histamine release measurement using human basophilic cell line, KU812 suspension, biological assays using goat antmime Immunoglobulin E (GAME) and biotinylated GAME, murine and human recombinant Interleukin 4(IL4) antimouse and antihuman CD40 antibodies for ex vivo Immunoglobulin E (IgE) assay, IgE response in human cells and finally in vivo IgE response, Ig ELISA and cytokine assay were performed. Thus after successful completion of such studies it might be possible to establish a versatile antiallergic compound. Some of these studies are discussed here.

KEY WORDS: Antiallergic; IgE; Interleukin; Histamine; Assay; Screening

Introduction

Allergic disorders such as rhinitis, sinusitis, atopic dermatitis, asthma, pollensosis and food allergy are most common causes of human diseases (Rodrigo et al., 2004; Kelly., 1997). Hypersensitivity of the immune system to a specific antigen (allergens) plays a central role in the initiation of asthma and allergic rhinitis. Key components of this process include Th2 lymphocytes, which are a major cellular infiltrate in asthmatic lung (Walker et al., 1992; Robinson, 1992) and the antibody, immunoglobulin E (IgE), which is over produced in majority of people who suffer from allergic condition (Matsushita et al., 1993). However, numerous other components implicated for controlling IgE response are not always translated to prevent asthma (Milgrom et al., 1999; Haak-Frendscho et al., 1994; Lin et al., 2004). Low affinity receptor for IgE (CD23) has been reported to have direct effects on IgE regulation, antigen presentation and airway hyper responsiveness (Yu et al., 1994; Flores-Romo et al., 1993; Saxon et al., 1991; Stief et al., 1994; Texido et al., 1994; Haczku et al., 1997; Ten et al., 1999; Kehry et al., 1989; Pirron et al., 1990). Interleukin 4 (IL-4) and IL-13 also are required for IgE responses in-vitro and in-vivo, and have other putative roles in the development of allergy beside from their direct activation of IgE (Clark et al., 1994; Bacharier et al., 2000; Grunig et al., 1998; Miyahara et al., 2004; Brusselle et al., 1995; Corry et al., 1996; Webb et al., 2000). Degranulation of mast cells caused by antigen-antibody reactions triggers such type-I allergic diseases and hypersensitivity of the immune system to a specific antigens like Th2 lymphocytes, IgE, IL-4 and 13, required for IgE responses plays a central role in the initiation. There are a number of pharmacological agents available for the treatment of allergic conditions such as asthma and allergic rhinitis. For a drug to be effective against allergic conditions, an action on a target that influences multiple mediators within the allergy cascade is required. Activity of IgE: interfering compounds against a diverse group of allergy mediators will provide us to establish compounds as powerful tools for the treatment of allergy based diseases. Consequently novel approaches are needed as efficient search for useful candidates to be screened as anti-allergic drugs, so that few novel therapeutic candidates can be discovered which can serve the purpose best. Here in the present study we overviewed on the few well established screening methods for anti allergic activity as an essential step to the development of effective anti allergic agents.

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