New Advances in Diagnosis and Treatment of Atopic Disorders

An Essay
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Contents

LIST OF ABBREVIATIONS

Ag	Antigen.
AIC	Allergen ISS conjugates.
APC	Antigen presenting cells.
AS	Allergen specific.
AU	Allergy unit.
BAU	Biological allergy unit.
BCG	Bacille Calmette Guerin.
C	Complement.
CAP	Cellulose polymer activated within a capsule.
CCL11	Eotaxin.
CCR3	Eotaxin Receptor.
CD	Cluster of differentiation.
cDNA	Complementary DNA.
CPG	Unmethylated cytosine-guanosine.
CRD	Component resolved diagnosis.
CRIT	Component resolved immunotherapy.
CTLA-4	Cytotoxic T-Lymphocyte antigen-4.
DCs	Dendritic cells.
EAR	Early asthmatic response.
EIA	Enzyme immunosorbant assay.
ELISA	Enzyme-linked immunosorbent assay.
ER	Endoplasmic reticulum.
FcεRI	High-affinity receptor for IgE.
FcεRII	Low-affinity receptor for IgE.
FEV_1	Forced expiratory volume in one second.
GM-CSF	Granulocyte monocyte-colony stimulating Factor.
HLA	Human leukocyte antigen.
ICAM-1	Intercellular adhesion molecule 1.

IFN	Interferons.
IgA	Immunoglobulin A.
IgE	Immunoglobulin E
IgG	Immunoglobulin G.
IL	Interleukin
IR	Index of reactivity.
ISSs	Immunostimulatory sequences.
IU	International unit.
LAB	Lactic acid bacteria.
LAR	Late asthmatic response.
LPRs	Late phase response.
LPS	Lipo Poly Saccharides.
LSPs	Long synthetic overlapping peptides.
LTB4	Leukotriene B4.
LTC4	Leukotriene C4.
MHC-I	Major histocompatibility complex class I.
MHC-II	Major histocompatibility complex class II.
MIP-1a	Macrophage inflammatory protein-1a.
MIP-1α	Macrophage inflammatory protein-1α.
MRT	Modified RAST test.
NGF	Neutrophil growth factor.
NK	Natural Killer cell.
NMR	Nuclear magnetic resonance.
nsLTPs	Nonspecific lipid transfer proteins.
ODNs	Oligodeoxy- nucleotides.
PAF	Platelet activating factor.
PBMC	Peripheral blood monocytes.
PEG	Polyethylene glycol.
PRR	Pattern-recognition receptors.
RAST	Radioallergosorbent test.
RIA	Radioactive immunosorbant assay.
SIT	Allergen specific immunotherapy.

SRs	Scavenger receptors.
TCR	T-cell receptor.
TGF-α	Transforming growth factor-α.
TGF-β	Transforming growth factor-β.
Th	T-helper cells.
TLR	Toll-like receptor.
TNF	Tumor necrosis factor
TR	Therapeutic unit.
Tregs	Regulatory T cells.
VPF/ VEGF	Vascular permeability factor/ Vascular endothelial cell growth factor.

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Introduction

Allergic atopic disorders, such as rhinitis, asthma, and atopic dermatitis, are the result of a systemic inflammatory reaction triggered by type 2 T helper (Th2) cell-mediated immune responses against 'innocuous' antigens (allergens) of complex genetic and environmental origin **(Romagnani, 2004).**

Allergic diseases are common, disabling and potentially life threatening that lead to production of excessive allergen-specific immunoglobulin E (IgE) **(Prescott and Jones, 2002).** The clinical manifestations of allergic diseases are often the same as with other diseases which makes their diagnosis difficult. Therefore, clinical practitioners often need a laboratory test that is capable of identifying them in a suitable manner with low costs, speed of execution, availability at most laboratories and a high level of sensitivity in identifying its target population **(Naspitz et al., 2004).**

Recent technological advances have provided a better understanding of underlying disease process and offered new potential therapeutic targets. New techniques include: peptide immunotherapy, allergen modification, allergen gene vaccination, and others **(Prescott and Jones, 2002).**

Immunotherapy is a therapeutic intervention in which the patient is administered increasing doses of an extract of specific allergen(s), to which the patient has been demonstrated to be allergic, in order to modulate the patient's immune response, thus, attenuate or eliminate the symptoms **(Bousquet et al., 1998).**

Vaccines are used in medicine as immune modifiers **(Bousquet et al., 1998).** Allergen vaccines are used in the diagnosis and treatment of allergic diseases as specific immunomodulatory therapy. In clinical practice, allergen vaccines have been shown to be effective in the treatment of allergy and anaphylaxis. Successful allergen immunotherapy is associated with a long-term decrease in antigen-specific IgE production, an increase in antigen-specific IgG production, a decrease in Th2 proliferation to antigen, and an increase in antigen-specific suppresser T cell activity **(Slater et al., 2000).**

Aim of the Work

The aim of this study is to spot light on the diagnosis of atopic diseases and their new treatment modalities.

An overview on Atopy

The term allergy was introduced by Clemens Von Pirquet in 1906 to describe overwhelming pathological reaction of the body due to intercurrent contact with antigens (Ags) **(Valenta et al., 2004).** Allergy is characterized by increased ability of some immunocompetent cells to respond to a group of ubiquitous Ags that activate the immune system after their inhalation, ingestion, or penetration through the skin **(Guerra et al., 2001).**

Combs and Gell, 1975 proposed a first detailed classification of allergic reactions in four types (I-IV) based on defined underlying pathomechanism (Table 1) **(Valenta et al., 2004).**

Type	**(I) Immediate**	**(II) Cytotoxic**	**(III) Immune complex**	**(IV) Delayed**
Ag	Pollens, molds, mites, drugs, and parasite	Cell surface tissue bound	Exogenous (bacteria, fungi) and autoantigen	Cell/tissues bound
Mediators	IgE & mast cells	IgG, IgM and complement	IgG, IgM, IgA And complement	Tc, TD, activated macrophage& lymphocytes
Time taken for reaction to develop	15-3o min	Rapid	4-12 hours	12-48 hours
Diseases& condition produced	Eczema, urticaria, anaphylaxis	Haemolytic anaemia, transfusion reaction	Autoimmune diseases(e.g.,SLE)	Contact dermatitis, leprosy, T.B

Table1: A summary of the four types of allergy **(Ghamriny, 2003).**