

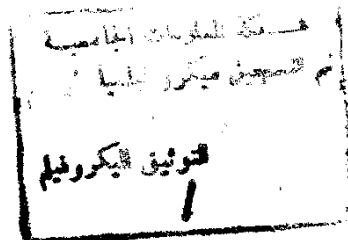
IMMUNOGRAM PATTERN BEFORE AND AFTER
AUTOHEMOTHERAPY IN PATIENTS WITH
BRONCHIAL ASTHMA

THESIS

SUBMITTED FOR THE PARTIAL FULFILMENT
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ABBREVIATIONS

Hb.	Haemoglobin.
T.L.C.	Total Leucocytic Count.
EOS. or E.	Eosinophils.
P.E.F.R	Peak Expiratory Flow Rate .
Ig	Immunoglobulin
Ig E	Immunoglobulin E
Ig G	Immunoglobulin G
Ig A	Immunoglobulin A
Ig D	Immunoglobulin D
IL	Interleukin
C D	Cluster of Differentiation
S D	Standard Deviation
M.	Mean
S.	Significance
N.S.	Non Significance
D.F.	Degree of Freedom
M.M.	Mixed Mould.
H.D.	House Dust.
C.D.	Cotton Dust.
D.H	Dog Hair
Y. egg	Yolk egg
W. egg	White egg
C.H.	Cat Hair
R.H	Rabbit Hair

INTRODUCTION

INTRODUCTION

This is a part of an extensive study undertaken in the Allergy Department of Ain Shams University Hospital in order to evaluate the role of hemotherapy in patients with different types of bronchial asthma and its effects on the humoral immune pattern and the clinical response of those patients.

Bronchial asthma is a complex clinical disorder with a wide clinical spectrum, affecting any age. A hallmark of asthma is bronchial hyperreactivity to a number of stimuli, leading to a wide spread narrowing of the airways, that changes in severity either spontaneously or with therapy, *(Seigel and Rachelefsky, 1985; Kay, 1988)*.

Optimal therapy of bronchial asthma aims at reversing the chronically progressive course of the disease and also to reduce its symptoms by reducing bronchial reactivity and improving residual lung functions, *(Sandorama Special issue, 1986)*.

There are different therapeutic modalities in treating bronchial asthma but most of them did not produce a satisfactory effect as complete cure of the disease, this together with many side effects of each.

In this thesis we studied a certain line of therapy in treating bronchial asthma which considered as an easy, cheap, safe and effective method with minimal adverse effects.

Hemotherapy is one of the oldest methods used in treatment of many diseases. especially in allergy this method was used on the assumption that it affects the immune system of the body with subsequent improvement of the clinical manifestations of the disease.

The scientific basis of this method is not clear up till now, also its effects on the immune system was not investigated or evaluated. even we could not detect any references for previous scientific study of the hemotherapy.

AIM OF THE WORK

LITERATURE REVIEW

An Overview of Immune System And Immunology

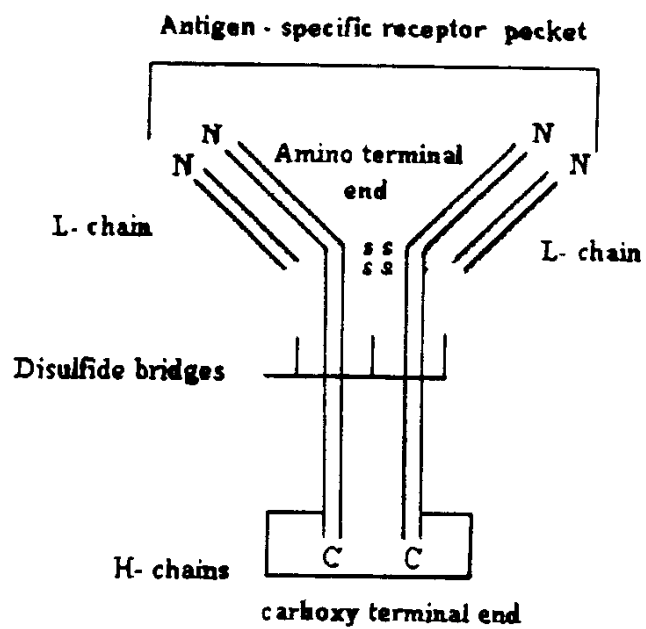
Immunology is the field of study that is concerned with understanding the immune system and processes through which it works (*Coleman et al., 1992*)

Protection against the effects of infective agents is known as *immunity*. It can be "innate" or "acquired", acquired actively or passively.

Innate immunity is not acquired, but rather is present since birth. In contrast to acquired immunity that is antigen specific. Innate immunity is not antigen specific.

Active acquired immunity is the result of the generation of immune products by an individual following exposure to an inducing agent. The inducing agent can be artificially introduced in the form of vaccine.

Passively acquired immunity comes about through the presentation to an individual of immune products developed by some other sources. (*Coleman et al., 1992*).



antibody molecule, (Kimball, 1986)
[FIG (1)]

Immunological responses can be defined as humoral when they are mediated primarily by antibodies and complement or cellular when they are mediated by cellular effector cells. Integration between these two pathways is common in the expression of immunity.

Humoral Mechanism

Antibodies :

The term antibody refers to a spectrum of proteins that are formed in response to an antigen and that react specifically with that antigen. Antibodies are belonging to a group of proteins known as immunoglobulins (Igs). (*Coleman et al., 1992*).

There are five major classes of immunoglobulins (**IgE, IgG, IgA, IgM and IgD**). All antibody molecules regardless of class, have a basic four-chain structure consisting of two identical light (L) and two identical heavy (H) polypeptied chains [*FIG (1)*]. Portions of both L and H chains vary uniquely in different antibody molecules, (*Kimball, 1986*).

Variable regions in each L and H chain form a specific receptor or "pocket" which is genetically programmed and complementary to a specific antigenic determinant. Thus, two identical receptor sites for binding specific antigenic determinants are present on each four chain structure, (*Coleman et al., 1992*).

Serum protein can be separated electrophoretically into α_1 , α_2 , β and δ globulin fractions. Antibody activity is found predominantly in

the γ globulin region, residing in a widely heterogeneous group of glycoprotein known as immunoglobulins. These molecules are secreted by plasma cells and circulate freely in serum and other body fluids where their role is to combine specifically with antigens. (*Kimball, 1986*)

Immunoglobulins can be divided into classes and subclasses consistent with characteristics that are independent of their ability to bind antigens. (*Coleman et al., 1992*). They can be divided according to different antigenic properties into five major isotypes.

IgG, IgA, IgM, IgD and IgE, the varied classes differ with respect to chemical and physical features and functions. (*Weir, 1988*).

IgG :

Immunoglobulin G is the most abundant class of Ig in the body, constituting approximately 75% of the total immunoglobulins and distributed equally within the intravascular and extravascular pools. Very little IgG is produced during the early stages of primary response to antigen, but it is the major form of Antibody produced during the secondary response.

There are four subclasses of human IgG (IgG₁, IgG₂, IgG₃ and IgG₄). Each subclass can be identified by a characteristic determinant numbers and arrangements of the interchain disulfide bonds.

IgG is the only class that can pass across the placenta. This is not a simple filtration process, but is due to a selective transference of the molecules

low affinity for antigenic determinant, but collectively they can exhibit pronounced avidity. In addition, IgM is more efficient than IgG in activating complement.

IgM is also important as an antigen receptor, where it occurs in monomeric form on early B-lymphocytes. In certain disease states, such as lupus erythematosus and rheumatoid arthritis, IgM may occur in monomeric form in rather high concentration. Monomeric IgM has a lower avidity for antigen than does the pentameric form. (Coleman, 1992).

IgM has a relatively short half life of five days in the circulation, but increased synthesis may occur. IgM deficiency often associated with susceptibility to septicaemia (Weir, 1988).

IgA .

Immunoglobulin A constitutes about 15% of human serum immunoglobulins. Where it exists primarily as a monomeric Ig. Perhaps the most important form is the dimeric form. Known as secretory IgA "*S.IgA*".

IgA is the predominant class of immunoglobulins in secretions such as milk, tears, nasal fluids, saliva, perspiration, genitourinary secretions, and seromucous secretions of the lung and intestine. Its function is to protect the various exposed epithelial surface from pathogenic microorganisms.

Secretory IgA is quite resistant to proteolytic digestion, which may be due in large part to the secretory component IgA and a polypeptide known

IgD is the major membran immunoglobulin during the course of B-lymphocytic differentiation, found principally as a surface membrane bound Ig on the majority of B-lymphocytes. (*Kimball, 1986*), (*Josephs, 1980*)

It has been proposed that **IgD** on B-lymphocytes may be involved in processing of antigen. **IgD** appears to be able to induce a T-cell population with receptors for **IgD** that enhance antibody responses. (*Weir, 1988*)

The role of **IgD** as a modulator of immune responses is under active investigation. (*Coleman et al., 1992*).

IgE :

IgE is quite important in the body, but it is normally found in extremely low concentration in the serum. Serum levels increase during allergic responses and certain parasitic diseases. It is associated with allergic type I immediate hypersensitivity in which specific **IgE** molecules may be generated against allergens.

IgE shares overall structural features with other immunoglobulins. It has a relatively high carbohydrate content. An important and unique property of **IgE** binding to mast cells. The biochemical basis for this binding is specific structural features of the Fc region. Particularly the CH₃ and CH₄ domains. The mast cell binding structure is heat labile.