STUDY ON CELL MEDIATED AND HUMORAL IMMUNITY IN PURE AND MIXED BILHARZIAL LIVER AFFECTION

THESIS

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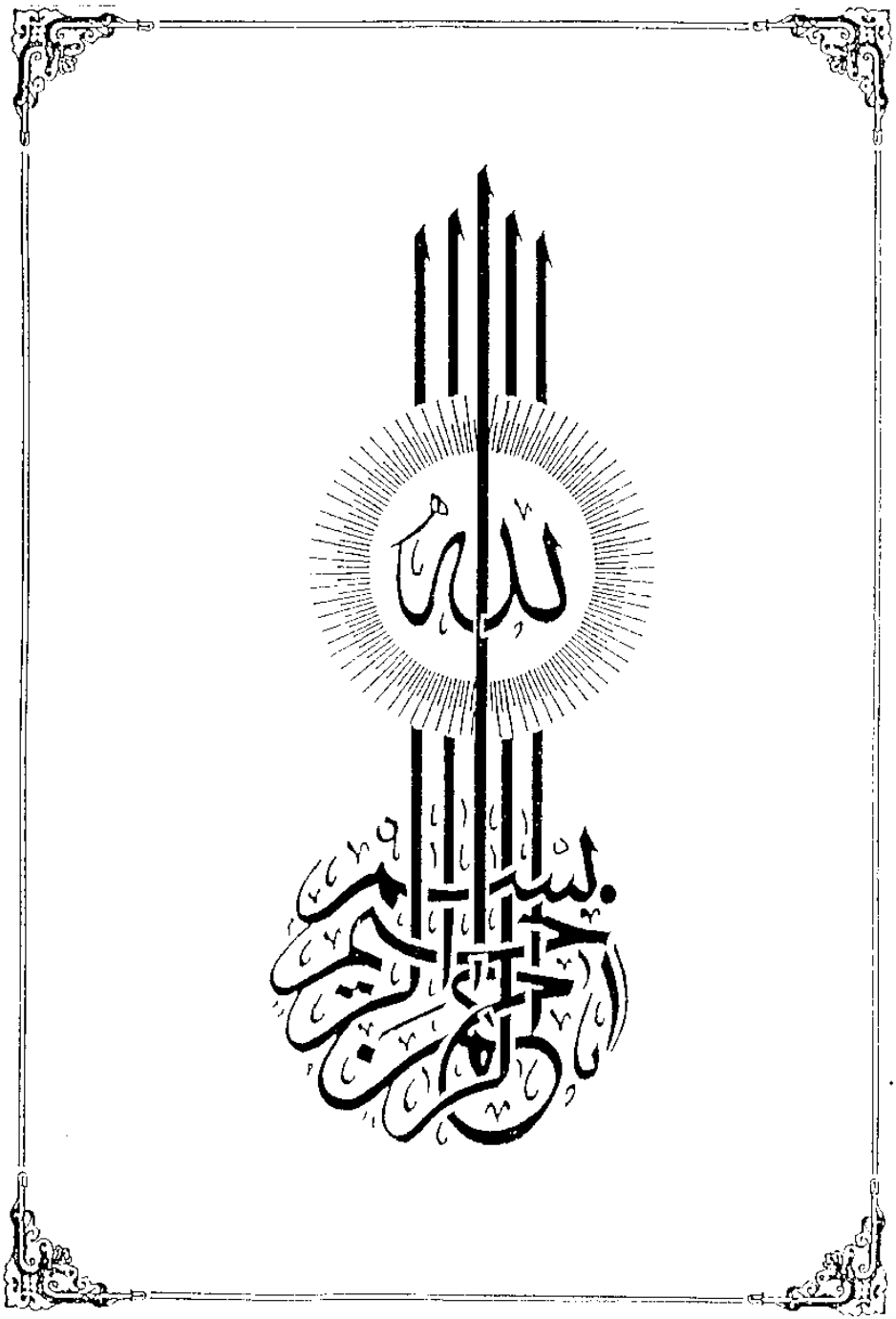
TO MY FATHER

TO MY WIFE AND CHILDREN

TO MY FATHER IN LAW



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INTRODUCTION

INTRODUCTION AND AIM OF THE WORK

Schistosomiasis is the most prevalent disease in Egypt, Ayad (1974). Viral hepatitis is also an important endemosporadic disease in Egypt. Significant higher incidence of viral hepatitis in schistosomal hepatosplenomegaly was demonstrated by many workers Guimaraes (1973); and Ata et al. (1977).

Bilharzial patients are more exposed to viral hepatitis infection. They may have their infection via cercarial penetration of the skin. Also bilharzial patients are subjected to repeated parenteral antibilharzial therapy and live under low socioeconomic conditions. Late and complicated cases remain in hospitals for long periods and may receive blood transfusion.

Schistosomal infection predispose to retention of hepatitis B antigen after subsidence of the acute attack Nooman et al. (1978 a). The outcome of viral hepatitis infection in cases of bilharzial hepatosplenomegaly have not been well studied.

Recently the ability to demonstrate HBsAg in serum and in liver tissue has made it possible to prove infection with hepatitis B virus and facilitates study of these cases.

Persistence of virus and its multiplication after acute viral infection is accompanied by different immunological changes (Dudley 1972). Also immunological factors play important role in the syndrome of bilharzial hepatosplenomegaly.

The aim of the present study was to study changes in cell mediated and humoral immunity in pure bilharzial hepatosplenomegaly and in cases retaining the hepatitis B virus. Another aim was to study the effect of this retained virus on liver pathology and the state of liver function.

BASIC IMMUNOLOGY

Immunology is the study of the processes by which the body defends and maintains the constancy of its internal milieu against invasion by foreign organisms or the mutation and development of unwanted cells or cell products within itself.

The subject of immunology is expanding in understanding the pathogenesis, diagnosis and prophylaxis of microbial and parasitic diseases.

Antigens and antibodies:

An antigen (Davis 1963) is defined as a substance which can stimulate animal to form proteins capable of reaction with it in a specific manner in vitro and in vivo. The antigen should be foreign to the animal to which it is introduced (hetero antigen), under certain circumstances that autologous or isogeneric material may be antigenic (Davis 1963).

The antigen should be of high molecular weight and high molecular surface, and of special chemical nature. Most complete antigens are proteins, but some are polysaccharides or polypeptides.

Antibodies are proteins that are formed in response to an antigen.

The Antibodies produced by a given antigen commonly react only with that antigen or closely related antigens. This avidity of antibodies for specific antigens is one of the most remarkable properties of antibodies. Antibodies belong to a group of serum proteins called "immunoglobulins". (Cohen 1963).

THE IMMUNE SYSTEM

The central immune system comprises the thymus and gastrointestinal lymphoid tissues, while the peripheral one is composed of spleen and lymph nodes.

Central immune system:

The thymus is composed of cortex and medulla. The cortex consists of closely packed small lymphocytes, numerous proliferating cells of lymphoid series and reticular stroma. The latter is mainly of endothelial origin although some mesenchymal cells may be present. The medulla contains no sinusoids but is formed of a net work of endothelial reticular tissue in whose meshes lymphocytes are present. Remnants of epithelial islands known as Hussel's Corpuscles are also present in the medulla. There are no afferent lymphatics. Drainage is mainly venous although some claim that lymphatic drainage is also present.

The gastrointestinal lymphoid tissues include the tonsils, adenoids, appendix and payer's patches. They are the counterpart of the cloacal organ or bursa of fabricious in birds. They are composed of cortical lymphoid follicles with little or no paracortical lymphocytes and no medulla.

The results of the following experiments are essential to recall so that the functions of the various components of the central immune apparatus could be properly understood.

1- Bursectomy in birds causes impairment of humoral immunity (H.I) while cell mediated immunity (C.M.I) remains intact.

2- Neonatal thymectomy, Miller (1961), (1962) prevents the development of (C.M.I) as allograft rejection. However some impairement of humoral type is also observed. It can be concluded that C.M.I. is thymus dependent while the gastrointestinal lymphatic tissues are essential for the development of humoral immunity. The latter is also partly dependent on thymus; a fact which is further supported by the high incidence of thymomas in patients with hypogammaglobinaemia, Martinez et al. (1962).

The thymus plays a key role in the development and maintenance of the immune system. It is the site of a very high rate lymphopoiesis comparable to that occurring in lymph nodes under maximal stimulation. The lymphocytes produced pass to the blood, interstitial lymph spaces, paracortical areas of lymph nodes and lymphoid rims surrounding the lymph follicles of the spleen.

These lymphocytes are called thymus derived or T lymphocytes and are responsible for C.M.I. The gland is essential for development of the immune system during neonatal period as proved by Miller's (1961), (1962) experiment of neonatal thymectomy. It is also essential for maintenance of the integrity of the immune system in adults as evidenced by occurrence of immuno-deficiency following thymectomy in adults which becomes apparent if the animal is challenged by an antigen 6 months later after operation.

The central immune system subserves its function independent of antigenic stimulation. The thymus seems to be under control of a stimulus from within the gland itself. This thymic factor probably a hormone secreted by the endothelial cells is responsible for development and maintenance of the immune system, Bach et al.(1972). (1973).

Peripheral immune system:

The lymph node is composed of cortex and medulla. The cortex is composed of primary and secondary follicles (germinal centers) and paracortical areas. The lymphocytes are closely packed in primary follicles but loosely arranged in the secondary ones. The paracortical areas are rims of tightly packed lymphoid cells between the