



Short Communication

Alterations of immunoglobulin expressions in newly diagnosed mycobacterium tuberculosis infected patients attending General Hospital Owerri

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ABSTRACT

The serum immunoglobulin (IgA, IgG, IgM) levels of Tuberculosis patients attending General Hospital Owerri, Nigeria were determined. Forty five confirmed Tuberculosis patients 20–60 years were selected. Forty five normal subjects age 20–60 years were used as control. The levels of immunoglobulin (IgA and IgG) were significantly increased in tuberculosis ($p < 0.05$), except immunoglobulin M, that was not significantly increased, when compared with the control. The result suggests, that increase in immunoglobulin (IgA and IgG) indicates that tuberculosis may be interpreted as humoral response to mycobacterial antigens.

Keywords: Immunoglobulin, tuberculosis, humoral response, mycobacterial antigens

INTRODUCTION

Tuberculosis (TB) is a potentially serious infectious disease that commonly affects the lungs. The mycobacterium is the causative agent of tuberculosis (Thoen et al., 2006). It is spread from one person to another through tiny droplets released into the air through coughs and sneezes. The various strains of tuberculosis resist the drugs mostly used to treat the disease. People with active tuberculosis must take several types of medications for many months to eradicate the infection and prevent development of antibiotic resistance (Konstantinos A, 2010 and Lawn SD and Zumla AI, 2011).

Tuberculosis mainly attacks the lungs and can also attack other parts of the body (Parish T and Stoker N, 1999). They are characterized by chronic cough with blood-tinged sputum, fever, night sweats, and weight loss. An estimated 13.7 million chronic cases were active globally reported world-wide in 2007 while an estimated 9 million new cases occurred (Griffith D and Kerr C, 1996).

A number of factors contribute to TB infections. The most important risk factor world wide is HIV; 13% of all people with tuberculosis are infected by the virus (Möller M and Hoal EG, 2010).

Tuberculosis is the second-most common cause of death from infectious disease in third world country especially Nigeria (Ahmed N and Hasnain S, 2011).

Recently the advent of immunology of tuberculosis has become a subject of great interest. Humoral response of the hosts to mycobacterial antigens depends upon the release of different types of immunoglobulins and is the expression of the functional capacity of immunoglobulin producing cells (Youmans GP, 1975). Few studies as regards the importance of immunoglobulins in patients of pulmonary tuberculosis have been reported (Selma et al., 2011). Hence, this study was carried out with the view of furthering knowledge of various immunoglobulins in tuberculosis patients.

MATERIAL AND METHODS

Forty five patients aged between 20 and 60 years attending General hospital Owerri having clinical, radiological and bacteriological evidence of active pulmonary tuberculosis were involved in the study. Forty five volunteers of the control group were of good health

Table1. Immunoglobulin levels in tuberculosis and control

PARAMETERS	IgA(Mg/dl)		IgG (Mg/dl)	IgM(mg/dl)
Control	351.16±	83.8	1295.71±89.9	96.21 ±18.7
tuberculosis	382.53	±122.9*	1327.3±217.4*	98.88±31.4

*Significantly different from control at $P < 0.05$.

and gave no history of previous illness relating to respiratory or liver problem. Both the control and patients belonged to different age groups between 20 and 60 years. Informed consent of the participants was obtained and was conducted in line with the ethical approval of the hospital.

Biochemical assay

Immunoglobulin A, G and M levels were determined by use of immunoglobulin kits AGAPPE IgG, IgA, and IgM. This is based on principle of measurement of the rate of increase in light scattered from particles suspended in solution as a result of complexes formed during an antigen-antibody reaction.

Statistical analysis: The results were expressed as mean $\pm$ standard deviation. The statistical evaluation of data was performed by using student's t-test. The level of significance was calculated at $P < 0.05$.

RESULTS

The level of IgA and IgG were significantly increased in tuberculosis when compared with the control, while IgM was not significantly increased when compared with the control ($P > 0.05$) (Table 1).

DISCUSSION

Tuberculosis is a main health problem globally resulting in large number of deaths, more than that from any other single infectious disease. It is quite obvious that immunology of tuberculosis and the importance of delayed hypersensitivity as protective immunity have been widely reported in the light of modern advance immunological techniques (Talat et al., 2002). The necessity of detection of serum immunoglobulin IgG and IgM antibodies have been documented in some diseases (Fatolahzadeh et al., 2007).

In this present study, the mean values of IgG and IgA were significantly increased in patients with pulmonary tuberculosis when compared with healthy subjects, while IgM was not significantly increased. This is in line with the

work of Jain et al., (1984). The reason for the constant increase in IgA is not quite clear. IgG is the predominant immunoglobulin in adult. The elevation of IgG in tuberculosis could be associated with its role in the neutralization of toxins (Bozzano F). When a specific IgG antibody binds to a bacterial antigen, it neutralizes the toxic activity. In the same vein, when IgG serves as a bridge between the *Mycobacterium tuberculosis* and phagocytic cells, the phagocytic activity of cell could be enhanced. This elevation in IgG is consistent with the work of Agnihotri et al., (2014).

Similarly, it was observed that IgA was significantly increased in tuberculosis patients when compared with the control. IgA is the second most abundant immunoglobulin after IgG (Bradley et al., 1979). The heavy chains of IgA are called alpha chains. Unlike the other immunoglobulins, disulphide bonds in IgA bind the light chains together and not the heavy chains. IgA occurs mainly as dimer in body fluids. This indicates that it has two subunits. This IgA contains a protein called secretory or transport piece. Likewise, the elevation of IgA could be linked to its role in protecting the body against the entry of pathogens and adherence to the mucous membrane (Silverstein AM, 2003). It forms an antibody paste on the mucous surfaces which plays a role in local immunity against respiratory and intestinal pathogen. The increase in IgA may also be linked to its tendency to attach the mycobacterium antigen (Faulkner et al., 1967 and Grosset J, 2003).

CONCLUSION

It is quite obvious that tuberculosis patients produce antibodies against more than one antigen. Hence, a wide Scale of humoral immune responses exists in among these patients.

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