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IMMUNOGLOBULIN LEVELS IN SCHISTOSOMIASIS

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SUMMARY

The concentration of the immunoglobulins (IgG, IgA and IgM) was determined by radial immunodiffusion in the sera of 155 persons: 104 from a rural area of Venezuela with schistosomiasis mansoni before receiving specific treatment, and 51 used as control. An IgG increase was found in the schistosomiasis mansoni patients, but the IgM showed no important variations when compared with the controls who were also from a rural area. A correlation between the IgG and IgM levels with the positive fluorescent antibody reaction could not be established.

INTRODUCTION

Using the Ouchterlony technique and antigen of adult worms, SILVA & FERRI [12, 13] demonstrated the presence of precipitin lines in 78.3% of the hepatosplenic and 37.9% of the hepatointestinal human schistosomiasis mansoni. By concentrating the serums and performing immunoelectrophoresis, they believed that those precipitin lines corresponded to human IgG and IgM. FIORILLO [6] reported later the presence of an intermediary fraction between beta and gamma globulin due to an increase of IgM in patients with the hepatosplenic form of schistosomiasis. When HYLLYER [8] quantified individually the IgG, IgA and IgM, he found a significant increase of gamma G and gamma M in the chronic forms of the sickness, and ASHWORTH [2] refers an IgM increase during the toxemic period of the disease.

These findings motivated the Authors to study the concentrations of gamma G (IgG), gamma A (IgA), and gamma M (IgM) in Venezuelan patients with schistosomiasis mansoni.

MATERIAL AND METHODS

A group of 104 out-patients, 6 to 70 years old, from a rural area of Venezuela (Aragua and Carabobo States), with schistosomiasis mansoni were studied. Fifty-five had the intestinal (Type I), 44 the hepatointestinal (Type II) and 5 the hepatosplenic (Type III) form of the disease according to the classification of PESSÔA [11]. Laboratory diagnosis was made by the presence of *Schistosoma mansoni* eggs in feces using KATO's method [9]. This group also had other intestinal parasites. Fluorescent antibody reaction (FA) was performed on 96 of these patients following the technique recommended by CAMARGO et al.[3] and used in the "Cátedra de Parasitología" by TORREALBA [14]. The intradermal test (IDT) was made on all patients employing the PELLEGRINO's procedure [10].

A second group of 51 subjects, 5 to 55 years old, from a rural non-endemic area of bilharziasis (Lara and Yaracuy States), with negative FA reaction was used as control. This control group had too, intestinal parasites, other than schistosoma.

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Total proteins were estimated by the method of GORNALL et al.[7] and quantification of immunoglobulins (IgG, IgA and IgM) were made by radial immunodiffusion as described by FAHEY[5] using antibody-agar plates (Immuno-Plates, Hyland Laboratories, Los Angeles).

RESULTS

The average and dispersive values of total proteins (expressed in g/100 ml) in the bilharziasis and control groups showed for the first group 7.19 ± 0.82 with a range of 5.7-9.0 and for the second 6.66 ± 0.50 with a range of 6.0-7.8.

In Table I the immunoglobulin levels of the schistosomiasis patients and the subjects from the non-endemic area are presented and compared with the results obtained by ARENDS & GALLANGO[1] in apparently healthy Venezuelan adults. A significant increase of IgG ($P>0.001$) was found in the bilharziasis patients when compared with subjects from the non-endemic area. However, concentration of IgG in the control group was less than the values reported as normal by the above-mentioned Authors. There was an increase of IgM in the two groups, and IgA showed no important deviations.

In Table II the immunoglobulin levels were compared with clinical forms of schistosomiasis. A significant increase of IgG was

TABLE I

Immunoglobulin levels in patients with schistosomiasis mansoni

	Number of subjects	IgG mg/100 ml	IgA mg/100 ml	IgM mg/100 ml	Ig Total mg/100 ml	% of Total Protein
Schistosomiasis mansoni	104	1707±256 (1240–2220)	256±72 (78—414)	137±41 (43—250)	2100	29.2
Non-endemic area	51	1438±188 (1060±1820)	238±81 (86—380)	128±23 (71—188)	1804	27.1
Healthy (*)	36	1647±240 (1197–2222)	258±95 (135—450)	74±33 (35—210)	1979	28.4

(*) According to ARENDS & GALLANGO[1]

TABLE II

Immunoglobulin levels in patients with schistosomiasis mansoni correlated with the clinical forms of the disease

Clinical forms	Number of subjects	IgG mg/100 ml	IgA mg/100 ml	IgM mg/100 ml
Intestinal	55	1682±270 (1240—2220)	260±69 (116—414)	140±41 (45—250)
Hepatointestinal	44	1758±223 (1340—2200)	256±77 (78—384)	131±40 (43—241)
Hepatosplenic	5	1540±260 (1240—1900)	219±55 (124—282)	152±33 (126—218)

noted in the intestinal and hepatointestinal forms. In the hepatosplenic form, little modification of immunoglobulins was observed.

In patients with positive IDT (52.9%) and in those with negative IDT (47.1%), the IgG were increased, but no variations were shown in the other immunoglobulins.

In the schistosomiasis patients on whom the FA reaction was performed, no differences in concentration of the IgG among the positive and the negative, nor of other immunoglobulins were noted.

DISCUSSION

In 1969 by fractionation of human serums, HILLIER (op. cit.) confirmed SILVA & FERRI's findings (op. cit.) concerning the two types of antibodies (IgG and IgM) present in human schistosomiasis. The results obtained in this work also showed an increase of IgG, in the patients with intestinal and hepatosplenic forms, due, perhaps, to the small number of subjects studied.

The Authors suggest that *Schistosoma mansoni*, and not the other intestinal parasites, was the important cause of this increase.

The increased IgM in the two groups studied could perhaps be explained by the frequency of other tropical diseases in the areas from where the patients came from.

After fractionating serums of schistosomiasis patients, DEL REY CALERO et al.[4] found that fractions containing IgM presented positive fluorescent antibody reaction and the same samples after treatment with mercaptoethanol, became negative indicating that the important antibodies in this case might be of the IgM type. However in the present investigation no correlation between the levels of the immunoglobulins, could be established, especially between IgM level and positive, of the FA reaction. Also no association between the positive intradermal test and the average level of any of the three immunoglobulins was demonstrated.

RESUMO

Níveis de imunoglobulinas na esquistossomose na Venezuela

Foi determinada a concentração das imunoglobulinas (IgG, IgA e IgM) por imunodifusão radial, utilizando placas Hyland de ágar-anticorpo, em 155 pessoas: 104 com esquistossomose mansônica, antes de receber terapêutica específica e procedentes do meio rural venezuelano; as 51 restantes formavam o grupo controle.

Nos pacientes com esquistossomose, o aumento da IgG foi acentuado. A IgM não mostrou variações importantes, quando comparada com a dos controles os quais procediam também do meio rural; porém em relação aos valores referidos como normais, por outros Autores no País, seu aumento foi evidente.

Não foi possível estabelecer correlação entre os níveis da IgG ou da IgM, com a positividade da reação de anticorpos fluorescentes.

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