

Antigammaglobulin Antibodies in Rheumatic Fever

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The theory of autoimmunity is supported by the findings of the presence of fixed gamma-globulin in auricular biopsies and humoral antimyocardial antibodies in the sera of patients with rheumatic carditis. It has been shown by Kaplan and Dallenbach using the immunofluorescent technique that in a certain proportion of rheumatic carditis cases gamma-globulin is attached to the myocardium.¹ After discovering fixed gamma-globulin in the myocardium a search obviously led to corresponding antibodies in the circulation of rheumatic fever patients. These antibodies were soon found by Kaplan, Myeserian and Kushner² and Hess et al.³

Our purpose in presenting this survey is to find out the proportion of anti-gamma-globulin antibodies in the circulation of rheumatic fever patients and also their association with regard to rheumatic carditis.

Materials and Methods

Our study included 22 Turkish children with a characteristic clinical picture of rheumatic fever, who were admitted to Dr. Sami Ulus Children's Hospital. The diagnosis of acute rheumatic fever was based on clinical and laboratory findings using the Jones criteria (at least two major, or two minor one major). The clinical and laboratory data on these patients according to the Jones criteria are given in Table I.

Before any therapy was attempted, 0,5 cc of blood, was drawn from patients experiencing the acute stage of rheumatic fever. The latex-

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fixation slide test was used in order to detect anti-gammaglobulin antibodies in the serum. It has been reported that the rheumatoid factor acts like anti-gamma/globulen antibodies.⁴ The latex fixation test was originally described by Singer and plotz as a tube test. They reported later that a slide modification was useful as a simple screening method.⁵ The indicator in the test consist of latex particles reactant in the fraction of pooled human serum. Three drops of serum (0.2 ml) from suspected case was placed on one slide and rheumatoid factor positive serum on the other slide. One drop (0,05 ml) % 1 Eosin added to each amount of serum and both were mixed with a toothpick. Two drops of latex solution (0,1 ml) were added to each slide and were mixed. In positive tests fine granular agglutination appeared in 1-3 minutes. The tests read as follows:

1. *Negative* : smooth suspension, invisible flocculation as shown by negative control
2. *Positive* : visible flocculation with small aggregates
3. *Positive* : visible flocculation with large aggregates as shown by RF positive serum control.

Results

Twenty-two cases were studied for anti-gammaglobulin antibodies. This study group included eleven boys and eleven girls between the ages of four and fourteen. The distribution of case findings according to the Jones criteria is listed in Table I. The cases included sixteen carditis, eleven arthritis, four eritema marginatum, two chorea, fifteen high fever, seven positive throat cultures, five previous rheumatic fever and rheumatic heart disease histories, four epistaxis, three with abdominal pains, five with prolonged P-R interval, and three with arthralgia. The ASO levels, sedimentation rate and leukocyte counts were found respectively between 250-1250 Todds unit, 55-120 mm/hr., 8000-1500/mm³

Among the 22 patients' sera, seventeen were given the positive latex fixation test (77,1%). The test results according to granular agglutination as shown by RF positive serum controls are listed in Table 1. 14 of these patients with the latex-fixation test (82,9%), clinical and laboratory findings proved them to have rheumatic carditis.

Discussion

Rheumatic fever is known acute condition characterized by multiple joint involvement and carditis. The lesions occur in the myocardial heart valves, in serous membranes and in both perivascular and suben-

TABLE I
CLINICAL AND LABORATORY DATA OF PATIENTS

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Age (Yr.)	9	8	7	13	8	10	9	10	8	11	4	13	13	11	8	7	7	13	13	8	6	14
Sex	F	M	M	F	M	F	M	F	F	M	M	F	M	F	M	F	M	M	F	M	F	F
Carditis	+	+	+	+	+					+		+	+	+	+	+	+	+	+	+	+	+
Arthritis	+		+	+		+	+	+	+		+	+					+	+				
Erythema Marginatum	+					+						+					+					
Subcutaneous Nodules																						
Chorea														+		+						
Fever		+	+		+		+	+	+		+	+	+				+	+	+	+	+	+
Sedimentation Rate	55	103	85	125	65	90	75	90	55	120	120	96	110	33	80	110	93	110	130	74	93	50
Throat Culture	+					+	+					+				+	+		+			
Previous R. Fever And Heart Disease				+						+		+							+			+
Leukocytosis (1X103)		13	9,4	12,1	13,9	6,2	13,1	15	12,8	11,2	11	9,2	11,2	13,8	12,4	9,3	10,8	11,2	10	11,4	9,5	13,4
ASO (Todd Units)	333	333	500	833	333	333	833	333	833	1250	500	833	833	333	500	500	350	833	1250	1250	500	333
Epistaxis													+		+		+		+			
Abdominal Pain													+	+				+				
Prolonged P-R Interval	+	+		+									+				+					
Arthralgia		+			+											+						
Latex Fixation	++++	++++	++++	++++	++++	++++	++++	-	-	-	+++	-	+++	+++	++++	++++	-	++	++++	++++	++++	++

dothelial connective tissue. There is evidence that in this disease, especially in rheumatic carditis, autoimmunization is responsible for the changes noted above. Calvetti et al. demonstrated the presence of autoantibodies (antirenal and antimyocardial) by the collodion particle agglutination technique in a high proportion of cases of rheumatic fever.⁶ It is stated that the presence of such an antibody has a statistically significant relationship to heart damage.⁷

Kaplan and Dallanbach by using the immunofluorescent technique found fixed gammaglobulin in 18 out of auricular biopsies of patients with rheumatic heart disease.¹ In addition to this, five fetal cases of rheumatic fever myocardium were massively infiltrated with gamma globulin deposition.¹ Meyeserian and Kushner reported that the presence of antimyocardial antibodies in rheumatic fever is about three quarters more than the other conditions.² Hees, Fink, Taranta and Ziffe used the immunofluorescent method in 171 acute cases of rheumatic fever. Positive results were shown in 71 cases (41,5%). In 201 inactive cases the incidence was only 16%. The frequency of positive is increased 63% in the presence of clinical carditis.¹ Some investigators considered that in acute rheumatic fever the antigen probably is streptococcal in origin and the antibodies are directed towards this antigen. Most of the patients who have had streptococcal infections antibodies which cross-react with streptococcal antigens and heart tissue.^{8, 9}

Williams studies 51 patients with subacute bacterial endocarditis and 50% showed the varying titer of rheumatid factor with the sensitized sheep cell agglutination test (hemagglutination). The majority of the patients using the positive hemagglutination test had streptococcus viridans as an infecting organism.¹⁰

In this survey, the latex-fixation test was positive in 17 out of 22 patients with acute rheumatic fever (77,1%). Fourteen of these patients' clinical and laboratory findings proved the diagnosis of rheumatic heart disease (82,9%).

Investigations have proved that autoantibodies against myocardial tissue or gammaglobulin are present in rheumatic fever, but the exact pathogenetic significance of such antibodies is not clear.

Summary

In Dr. Sami Ulus Children's Hospital twenty-two patients between the ages of four eleven year with a characterisitic picture of rheumatic fever were studied for the presence of anti-gammaglobulin antibodies. In seventeen out of twenty-two (77,1%) the latex-fixation test gave

positive results. Fourteen of these patients had active rheumatic heart disease (82,9%). The significance and the frequency of these antibodies rheumatic fever is discussed.

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