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IMMUNOGLOBULIN PHENOTYPIC PROFILE IN RHEUMATOID ARTHRITIS

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ABSTRACT

The study was performed on a representative group of 100 Caucasian patients, of Romanian nationality. The diagnosis of rheumatoid arthritis was established based on anamnesis, clinical examination, paraclinical investigation, and laboratory analyses. Two methods were used to determine the serum levels of immunoglobulins (IgG, IgA, and IgM) and rheumatoid factor (RF): Radial immunodiffusion (RID) and Waaler-Rose test. Most patients with seropositive reactions were observed in the second stage of the disease. Regarding serum levels of immunoglobulins, IgG was increased in 58% of cases (values between 250 and 1000 IU), IgA was within normal limits in 61% of cases (70-250 IU) and IgM had normal values in 72% of cases (100-200 IU). The results of this research have great practical applicability, because they favor the early diagnosis of the disease, guide towards the identification of patients with a high risk of the occurrence of the disease, allow the assessment of the prognosis of the disease, and favor the early application of specific preventive measures.

KEYWORDS: Rheumatoid arthritis; Immunoglobulins; Rheumatoid factor.

INTRODUCTION

Rheumatoid arthritis (RA), a multigene disorder with a substantial genetic component, is an autoimmune chronic inflammatory systemic disease that affects approximately 0.5–1 % of

the population.[1,2,3] RA primarily affects the small joints of the hands and feet and causes chronic synovial inflammation eventually leading to joint destruction and disability.[1,4,5] The heritability of RA is estimated at 60%.[1,4,6,7] To date, over 100 susceptibility loci have been identified for RA.[7]

MATERIAL AND METHODS

The study was performed on a representative group of 100 Caucasian patients, of Romanian nationality. The diagnosis of rheumatoid arthritis was established based on anamnesis, clinical examination, paraclinical investigation, and laboratory analyses.

Two methods were used to determine the serum levels of immunoglobulins (IgG, IgA and IgM) and rheumatoid factor (RF):

1) Radial immunodiffusion (RID), a quantitative method, was used to determine the serum concentration for immunoglobulins, IgG, IgA and IgM.
2) Waaler-Rose test, a hemaglutination slide test, was used for the rapid qualitative and semi-quantitative detection of rheumatoid factor in human serum.

RESULTS AND DISCUSSIONS

In the first stage of the disease, seronegative reactions for RF (Rheumatoid Factor) were recorded in 4 women and seropositive reactions in 7 women patients. FR seropositive reactions were also observed in 2 men with RA.

In the second stage of the disease, 19 women had RF seronegative reactions and 30 women patients had RF seropositive reactions. In men, in the same of disease, 5 patients had RF seronegative and 6 had RF seropositive reactions.

In the third stage of the disease, 5 women were RF seronegative, 10 women patients were RF seropositive, and in the case of men, 1 man was RF seronegative and 11 men patients were RF seropositive (Table 1).

Of the total of RA patients, 34% were FR seronegative and 66% FR seropositive (Figure 1).

Table 1: RA distribution by age, stages, and seronegative/seropositive RA tests.

	RA Stage 1				RA Stage 2				RA Stage 3			
Patients	**women**		**men**		**women**		**men**		**women**		**men**	
	SN	**SP**	**SN**	**SP**	**SN**	**SP**	**SN**	**SP**	**SN**	**SP**	**SN**	**SP**
Number	**4**	**7**	**-**	**2**	**19**	**30**	**5**	**6**	**5**	**10**	**1**	**11**

SN - seronegative; SP – seropositive

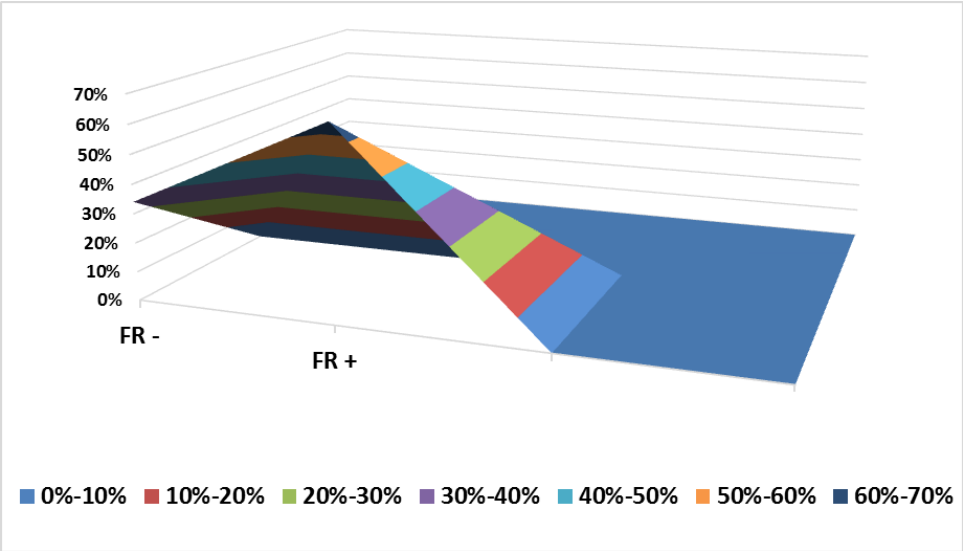

Figure 1: Patients distribution by seronegative/seropositive RA tests.

Quantitative and qualitative values of IgG, IgA, and IgM immunoglobulins reveal the following results:

1) IgG was increased in 58% of cases (values between 250 and 1000 IU). Most patients had values between 250 and 450 IU. In 15% of patients, IgG values were low (below 100 IU), and in 27% of patients with RA, IgG values were normal, being between 100-200 IU. (Figure 2).

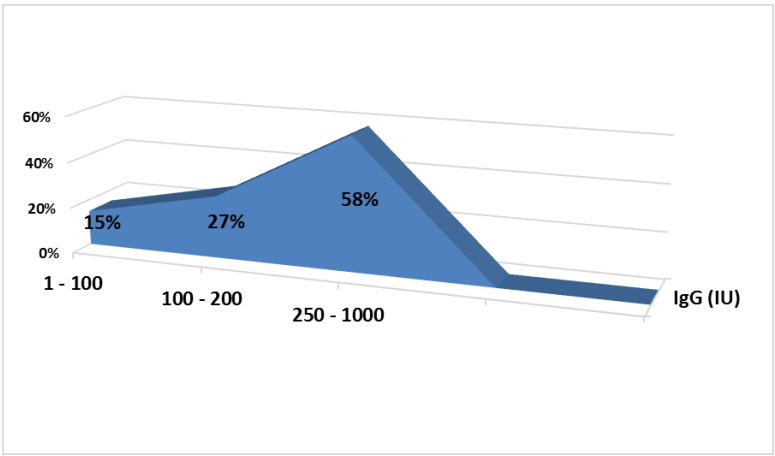

Figure 2: Ig G serum levels in patients with RA.

2) IgA was within normal limits in 61% of cases (70-250 IU). In the rest of 36% of patients, IgA values were high (over 3000 IU). Low values were recorded only in 3% of patients with RA (Figure 3).

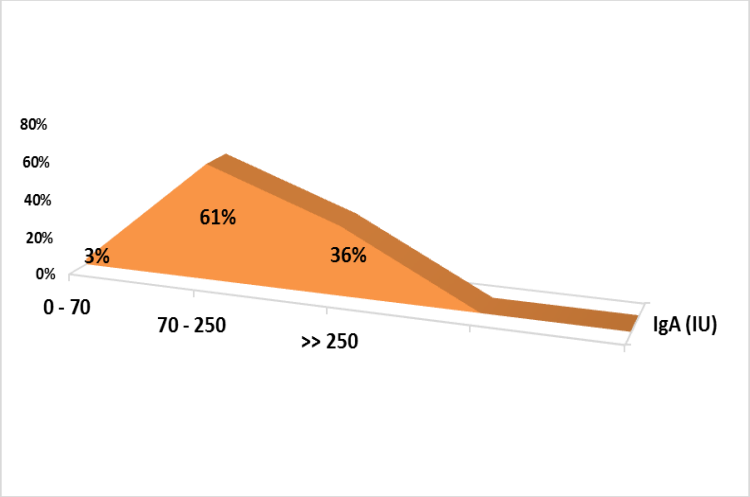

Figure 3: Ig A serum levels in patients with RA.

IgA deficiency, the most common primary immunodeficiency, is significantly associated with mucosal infection, increased risk of atopic disease, and a higher prevalence of autoimmune diseases (systemic lupus erythematosus, rheumatoid arthritis, juvenile idiopathic arthritis, ankylosing spondylitis, vitiligo, scleroderma, lichen planus, alopecia areata, multiple sclerosis, autoimmune peripheral neuropathies, ulcerative colitis, celiac disease, autoimmune hepatitis, autoimmune congenital heart block, immune thrombocytopenic purpura, autoimmune hemolytic anemia, myasthenia gravis and).[8-13]

3. IgM had normal values in 72% of cases (100-200 IU), and high values in 26% of the patients with RA. Only 2% of patients with RA had low serum levels of IgM, (Figure 4).

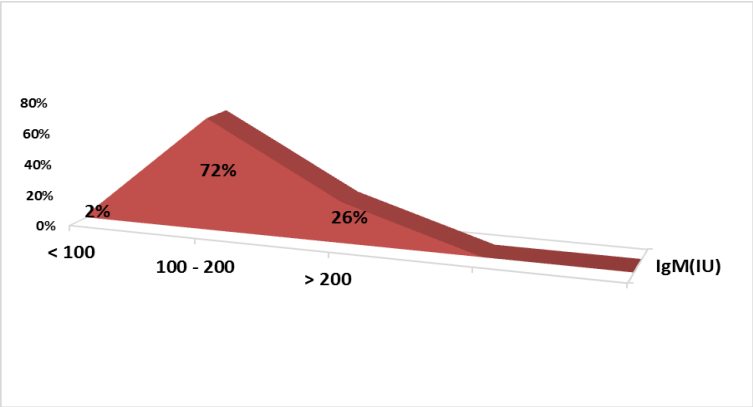

Figure 4: Ig M serum levels in patients with RA.

Increased serum levels of IgG may be due to increased synthesis, in response to intense and prolonged antigenic stimulation.

The maintenance of an increased serum IgA attests to their intervention in the local immune defense.

IgM remained mostly within normal limits. Due to the fact that 72% of cases are RA seropositive (so with FR present), and FR belongs mainly to the IgM class, we can expect to predominate the cases with low IgM serum levels.

In the study group, after the latex reaction, FR was positive in 72% of patients with RA, with titer values between 1/160 and 1/320 titers**,** (Figure 5).

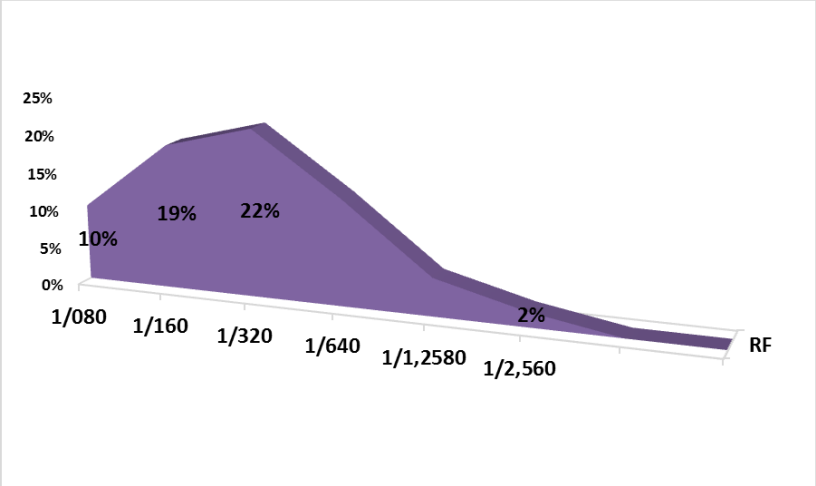

Figure 5: Distribution of RF Values.

CONCLUSIONS

Rheumatoid arthritis, a disease with a genetic predisposition, induces a specific immune response to an unusual antigenic stimulus, possibly of an infectious nature.

The results of this research have great practical applicability, because they favor the early diagnosis of the disease, guide towards the identification of patients with a high risk of the occurrence of the disease, allow the assessment of the prognosis of the disease, and favor the early application of specific preventive measures.

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Conflict of interest

The authors declare no conflict of interest.

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Statement of informed consent

Informed consent was obtained from the patient included in the study.

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