

## Serum Immunoglobulin and Complement Levels in Scabies

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*The human immune system interacts bidirectionally with environmental, metabolic, and endocrine factors as well as with infectious agents and is arranged genetically. Scabies is an important parasitic skin disease that continues to persist all over the world despite the availability of many acaricides and therapeutic tools. Individuals with scabies react to parasite mainly by generating a cell-mediated immune response. Immunologic reactions mediated by antibodies of the immunoglobulin G (IgG), IgM, and especially, IgE classes may also be involved. None of these reactions have been shown to eliminate all mites from the skin surface, but locally these reactions may prevent the epidemic multiplication of scabies' organisms on the skin surface, as observed in some patients with Norwegian scabies. The purpose of this study was to determine antibody response and changes in serum levels of some complement componenes in scabies. [Journal of Turgut Özal Medical Center 1997;4(1):37-39]*

**Key Words:** Scabies, immunoglobulins, complement

### Skabies'te serum immünglobülin ve kompleman düzeyleri

*İmmün sistem; çevresel, metabolik, endokrin ve enfeksiyöz faktörlerle karşılıklı etkileşim içinde olup bu ilişkiler genetik olarak düzenlenmektedir. Skabies, çeşitli ilaçlar ve tedavi yaklaşımlarına rağmen dünyanın her tarafında görülmeye devam eden önemli bir paraziter deri hastalığıdır. Skabies'te immün cevap esas olarak hücresel immün sistem (geç tip hipersensitivite) tarafından oluşturulmaktadır. Bunun yanında skabies'e karşı antikor cevabı da oluşmaktadır. Bazen bütün parazitler temizlenemese de, immün reaksiyonlar etkenin kontrolsüz şekilde çoğalmasını önleyerek eliminasyonuna yardımcı olur. Bu çalışmanın amacı; skabieste gelişen antikor cevabını ve kompleman değişikliklerini araştırmaktır. [Turgut Özal Tıp Merkezi Dergisi 1997;4(1):37-39]*

**Anahtar Kelimeler:** Skabies, immünglobülinler, kompleman

An intact immunity entails all the forces and systems involved in recognition, specific response and removal of foreign objects after they again enter

into the body of the host. Scabies is a pruritic skin disease caused by *Sarcoptes scabiei var. hominis* which is characterized by severe itching

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(particularly at night), red papules and often secondary infection. The female mite digs tunnels in epidermis to lay her eggs and elicits a very itchy papule that is often excoriated. Sometimes ulcerated papules, nodules, and vasculitis develop as a result of other immunologic reactions in skin. The newly hatched mites pass easily from person to person by direct or close contact. Commonly infested areas are the skin between the fingers, elbows, axillae, groin, penis, and nipples. Both the cell-mediated immune reaction in the skin and the circulating antibody response act parallelly in clearing of the mites, eggs and debris. The data on humoral immune response to scabies is less whereas T-cell mediated immune response to scabies is well documented (1-3).

In this study, the serum levels of IgG, IgM, IgA, IgE, C3, and C4 were evaluated in 42 scabietic patients with no secondary infection or other parasitic infection.

## MATERIALS AND METHODS

A total of 42 patients (22 males and 20 females) with clinically and parasitologically proven scabies and 46 healthy controls (20 males and 26 females) were included in this study. The patients had no secondary infection or other parasitic infection. The causative agent was *Sarcoptes scabiei var. hominis*. Plasma from patients and controls were collected, centrifuged, and seperated sera without lypemia and hemolysis were frozen at -20° C until assayed. IgE was measured using enzyme-linked immunosorbent assay (IgE ELISA Test Kit, Genzyme, CA, USA). IgG, IgM, IgA, C3, and C4 were measured using immunoturbidometric assays (SPQ™ Test System, Atlantic Antibodies, USA) by previously described techniques. The student's t-test in SPSS for Windows program was used for statistical analyses.

## RESULTS

Our study group was consisting of 22 men and 20 women aged 4 to 60 (mean 28.2±16.3) years whereas 20 men and 26 women aged 7 to 58 (mean 31.6±13.4) years were chosen as control group. There was no significant difference between study and control groups according to the mean ages (p>0.05). In scabietic patients, serum IgG values were 2084.86±897.67 mg/dl, IgM levels were

175.16±84.53 mg/dl, IgA values were 270.74±109.85, IgE levels were 155.68±119.81 IU/ml, C3 values were 177±81.34 mg/dl, and C4 levels were 36.40±17.29 mg/dl. These values in control group were 2130.50±670.28 mg/dl for IgG, 140.12±76.87 mg/dl for IgM, 329.92±116.74 mg/dl for IgA, 129.63±51.28 IU/ml for IgE, 160.37±61.22 mg/dl for C3, and 32.52±14.28 mg/dl for C4. All of these information is summarized on Table 1.

**Table 1.** Epidemiologic and immunologic properties of the scabietic patients and controls

	Patients	Controls	p
Age (years)	4-60 (28.2±16.3)	7-58 (31.6±13.4)	>0.05
Number	42 (22 M, 20 F)	46 (20 M, 26 F)	
IgG (mg/dl)	2084.86±897.67	2130.50±670.28	>0.05
IgM (mg/dl)	175.16±84.53*	140.12±76.87	<0.05
IgA (mg/dl)	270.74±109.85*	329.92±116.74	<0.05
IgE (IU/ml)	155.68±119.81*	129.63±51.28	<0.05
C3 (mg/dl)	177.71±81.34	160.37±61.22	>0.05
C4 (mg/dl)	36.40±17.29	32.52±14.28	>0.05

## DISCUSSION

To elucidate the etiological role of immunoglobulins and complement in scabies, the circulating antibody and complement profiles were investigated in forty-two parasitologically proven scabietic patients and compared with healthy controls. Patients with scabies response to bites mainly by generating a cell-mediated immune response. Other immunologic mechanisms, especially humoral immune reactions can also be involved.

We found no significant difference between IgG levels in study and control groups. In the literature, there are controversial results on this issue. Morsy et al. indicated that IgG levels were significantly higher in scabietics than in controls both before and after treatment of the disease (2). Similar results were reported by some other investigators (3,4,5). In an animal study, antibody response was stronger in infested rabbits than in immunized ones (6). In a similar study, the sensitizing and challenge infestations induced circulating scabies-specific antibody responses, but the response was more rapid during the reinfestation challenge (7). Conversely, IgG showed a non significant increase in scabietic patients than that of the control group in another study (8). So much to that lower circulating

antibody levels were measured in scabies-infested hosts immunized with *Dermatophagoides* mites (9).

IgM levels were significantly higher in patients than in controls as parallel with some previous studies (1-3,5,7). On the other hand, a non significant increase in IgM levels of patients was observed in one study (8).

We observed a significant decrease in IgA values in patients than compared to the controls. Morsy et al, Hill et al, and Arlian et al have found similar results in their investigations (2,4,9). On the other hand, in some studies, IgA showed non significant increases in patients compared to controls (3,5).

IgE levels were significantly higher in our study group than in the control group in parallel to some others (1-3,5,7,8). The same contradiction is present is also here, some studies have indicated that measurement of total serum IgE would be of no benefit in the preliminary clinical investigation of a suspected host (4).

We found no significant differences in C3 and C4 values between patients and controls. Most of the previous studies have indicated similar results (1,2) whereas in one study, elevated levels of complement C3 were observed (3).

The changes in the IgG, IgM, and in particularly IgE may be specific response to the parasite or a non specific reaction to the dead parasite or its feces and debris or even to a secondary infection. On the other hand, the decrease in the IgA may be due to the mite or its products which interfere with its synthesis. It is concluded that immunity to scabies mites involved mainly a cell-mediated immune response but scabies is also associated with a humoral immunological response against the mite infestation. Studies performed on large population are necessary to solve some controversial results on this subject.

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