IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 15, Issue 5 Ver. V (May. 2016), PP 97-100
www.iosrjournals.org

Sequential Testing Of Serum Immunoglobulins in Patients WithActive And Treated Scabies

Dr. Inas K. SharquieMSc; PhD.[1], Dr. Zeena A.A. ShararahMBChB.[2], Aytan M. Al BayatiBSc[3].

[1]*Department OfMicrobiology, College Of Medicine, University Of Baghdad, Baghdad, Iraq.*
[2]*Department OfDermatology, Baghdad Teaching Hospital; Medical City, Baghdad, Iraq.*
[3]*Teaching Laboratories,Medical City, Baghdad, Iraq.*

Abstract:
Background: *Scabies is the commonest cause of itching in many countries, where the itching and skin rash are mainly due to the allergic reactions included both humoral and cell mediated. Many patients might continue to have itching and rash even weeks and months after recovery and cure from the disease. *
Objectives: *The aim of present work is to measure different types of immunoglobulins includingIgE, IgA, IgM and IgG during different stages of scabies including active scabies and after recovery from disease for at least one month and more and to be compared with the healthy individuals.*
Patients and Methods:*Three groups of patients were included in the present study, twenty eight patients had active scabies((21 females and 7 males) aged 7-70 years, with a mean of 36±15 years (mean±SD)), while 21 were treated patients((15 females and 6 males)aged 12-75 years, with a mean of 37.62±14.74 years (mean± SD)) and 25 healthy controls ((15 males and 10 females) aged 22-49 years, with a mean of 33.96 ±7.3 years (mean±SD))were included in the present work. Blood from all groups were collected and serum was obtained to measure IgA, IgM and IgG levels using radial immunodiffusion and to measureIgE level using ELISA technique.*
Results:*The findings of this work showed an elevation in the IgE levels of treatedscabietic for one month or more as compared to patients withactive scabies but was statistically notsignificant (p=0.287). In addition, there was a significant increase in IgE levels of treated scabieticpatients as compared with health control (p =0.0003).*
Serum IgA levels in patients with active scabies were comparable to that healthy control, and continued to raise post recovery, notably one month after treatment. Also it was noticed that IgM levels increased during active scabies, then after one month after therapy went to a level comparable to healthy control. And IgG levels in patients with active scabies were similar to levels after one month of recovery and were not statistically different from healthy controls (p= 0.0820). While there was a statistically significant increase in IgG level of treated scabietic patients for more one month as compared with healthy control (P= 0.0340).
Conclusion:*IgE was the most important immunoglobulin in correlation with the manifestation ofthe disease as it rose during active scabies and more after recovery. While there was no much change in the IgA levels in all groups. And patients with active scabies had high IgM while IgG was raised in both patients with active and treated scabies*
Keywords:*Active and treated Scabies, Immunoglobulins testing.*

I. Introduction

Scabies is an endemic/epidemic in Iraq and one of the most common causes of itching in dermatology. While its therapy is simple, patients can experience itching for weeks and even months after treatment andcure of their disease. The cutaneous manifestations of scabies are mostly attributed to immunological causes such as urticarial reactions, dermatitis, active nodules or post-scabietic nodules. As with itching, rashes cancontinue with post-scabietic nodules for weeks and even months [1].

While some initial itching could be contributed to manifestation of mite in the skin, the primary causes are an immunological reaction and sensitization. It has been reported that there are different immunological reactions to scabies, with the main ones being cell-mediated and humoral [2, 3].

Immune responses thatare seen in scabies patients are complex.The literature is plenty with reports about scabies-specific cellular or humoral immunity [4]. Both humoral and cell-mediated immune responses were investigated in scabietic patients [5, 6]. A Type I (immediate hypersensitivity) reaction was associated with elevation of IgE, and a Type IV (cell-mediated hypersensitivity) reaction which is manifested by superficial and deep perivascular infiltrates of mixed inflammatory cells (lymphocyte, histiocytes and eosinophils) [4]. The predominant lymphocytes in the infiltrates are found to be T lymphocytes [7], which play a crucial role in the activation and regulation of immune responses by recognizing antigens and inducing cytokine production.

The histopathological findings are mainly acanthosis of epidermis and diffuse dense dermal lymphocytic infiltrate with eosinophilic reaction which could dominate the main histopathological picture and these histopathological changes are in favor of the immunological reactions [1, 8].

The aim of the present work was to measure different types of immunoglobulins both during active infestation and after recovery from scabies and to subsequently correlate those results with the clinical picture and with what have been published about the histopathological andimmunological findings.

II. Patients and Methods

This observational clinical and immunological study was conducted in the Department of Dermatology and Venereology at Baghdad Teaching Hospital, Medical City–Baghdad, Iraq from June 2015 to January 2016.Forty nine patients with scabies were enrolled in this study. The nature and aim of this study as well as the nature of the disease were explained to each patient. Formal consent was obtained before taking a blood samples. Additionally, ethical approval was obtained from the Scientific Council of Dermatology & Venereology–Iraqi Board for Medical Specializations. History and clinical examinations were completed for all patients.Relevant data was recorded for all patients regarding name, age, sex, occupation, residence and previous personal and family histories of scabies. The patients were fully examined for the sites, numbers and sizes of the persistent scabietic nodules.

All patients seen in this study had either active scabies or a definitive history of scabies but treated via different modalities of scabiecides. Twenty-eight patients had active scabies at the time of presentation, with their diagnoses confirmed by the presence of burrows in the predilection sites of involvement. Twenty-one patients were studied and evaluated at least one month and more after therapy and cure but 12 patients continued to have itching and four had post-scabieticnodules. Twenty-five healthy controls (15 males and 10 females) were included in this study.

Blood from both scabies patients and controls were collected, centrifuged and separated for sera without hemolysis and were frozen at -20°C until assayed. IgE levels were measured using an enzyme-linked immunosorbent assay (IgE ELISA Test Kit, Demeditec, Germany), according to the manufacturer's instructions. IgA, IgM and IgG levels were measured using radial immunodiffusion (RID Kit, LTAonline, Italy).

Statistical analyses were performed using GraphPad Prism 5.01 (GraphPadSoftware, Inc., San Diego, CA, USA). The Student's t-test was used to assess the significance. Data was considered statically significant when p-values were less than 0.05. *: $p \leq 0.05$, ** $p \leq 0.01$ and *** $p \leq 0.001$.

III. Results

Forty nine patients were included in the present work, 36 females and 13 males and their ages ranged from 7-75 years, with a mean 36.87± 14.76 years (mean± SD). Patients with active non-treatedpatients were 28, 21 females and 7 males, aged 7-70 years, with a mean of 36±15 years (mean± SD). While 21 treated patients that had recovery from the disease for at least one month and more,15females and 6 males and aged 12-75 years, with a mean of 37.62±14.74 years (mean± SD).Additionally, 25 healthy individuals were included as controls (15 males and 10 females) aged 22–49 years, with a mean of 33.96 ±7.3 years (mean± SD).

The results of this study indicated an elevation in the IgE levels ofscabietic patients who had been treated for one month or more as compared to scabietic patients who had active scabies at the time of presentation. In addition, there was a significant increase in IgE levels of scabietic patients with treatment for more one month patients as compared with health control (p =0.0003), Table (1).

In those with active scabies infestations, serum IgA levels were comparable to that healthy control, and continued to raise post recovery, notably one month after treatment, Table (1).Also it was found that IgM levels increased during active scabies infestations, then after one month after therapy went to a level comparable to healthy control, Table (1). IgG levels in patients with active scabies were similar to levels after one month of recovery and were not statistically different from healthy controls (p= 0.0820), Table (1).While there was a significant increase in IgG levels of scabietic patients with treatment for more one month patients as compared with health control(P= 0.0340), Table (1).

Table (1): Studied parameters in scabietic patient and healthy controls

Parameters / Studied Group	IgE	IgA	IgM	IgG
Active scabies	303.8 ± 71.91 N=28	216.8 ± 20.47 N=28	206.8 ± 15.56 N=28	1093 ± 34.96 N=28
Treated patients	429.4 ± 94.87 N=21	263.2 ± 25.70 N=21	180.7 ± 18.34 N=21	1145 ± 52.82 N=21
Healthy patients	77.41 ± 24.36 N=25	217.1 ± 14.54 N=25	182.0 ± 17.21 N=25	990.2 ± 47.12 N=25

***Data are expressed as mean ± standard deviation (SD)**

IV. Discussion

Scabies is a common parasitic infection of the skin. Although its therapy is simple, many patients continue to experience itching and rashes for weeks and even months after recovery.Histopathological examination of the rashes in patients with scabies infestations had shown acanthosis of epidermis and diffuses dense dermal lymphocytic infiltration but in some patients an intense eosinophilic infiltration of the dermis might be seen that may form masses of eosinophilic collections forming so called eosinophiloma[8, 9]. Immunological assessments of patients with scabies showed both cell-mediated and humoral reactions.

The goal of this study was to measure the serum immunoglobulins and explore their correlation with the clinical picture of scabies, especially during the active and recovery phasesand also to be correlated with what has been published about the histopathological findings of scabietic rashes especially in patients with post-scabietic nodules.

It was found in the present work,that the IgE level was always high in active stage scabies, and it continued to rise, even after therapy. This confirms that sensitization to the scabietic antigen continues for weeks and even months, which correspond with the findings of many scabietic patients who, while cured, continue to encounter itching for weeks to months, especially those with post-scabieticnodules. The raised IgE levels were well correlated with high eosinophil in post-scabietic nodules. Accordingly, assessing the serum IgE in patients with suspected recovery from scabies helps to determine if they truly have recovered or not. If their IgE level is very high, this indicates the absence of active scabies and that the patient is in the post-scabietic period.

Regarding the IgA, after reviewing the literature, we found that there is significant controversy between different studies; some have found low IgA levels in patients with active scabies [6, 10], while others have found normal or even high levels [9, 11]. The present work had found that the serum IgA levels of patientswith scabies were very comparable to the healthy control.

A rising serum IgM level generally indicates active infection of any disease; however, reports regarding immunoglobulin in patients with scabies differ. Many investigators reported substantially elevated total IgM levels within scabies patients relative to the control group, prior to and post treatment [6, 9, 12, 13]. Conversely, other studies have shown no significant differences in IgM immunoglobulin levels between patients with scabies and those from control groups [10, 14]. In the present study, we found that the IgM level was raised during active scabies while, as expected, it declined gradually after one month of therapy and remained parallel to the serum of the healthy controls. These results are comparable to another study that observed a decrease in total IgM post-treatment[15].

Measuring IgG levels in patients with scabies in the present work showed that IgG in active scabies was similar to its level after one month of recovery and, statistically, was not different than the levels found in healthy controls. Hence, IgG in patients with active scabies has no immunological importance during the course of scabies. These results were comparable to what has been published in other medical literature [10, 14]

V. Conclusion

Patients with scabies had raised IgE levels during both the active phase and after recovery, which confirms active sensitization and correlates with the continuous itching and rash and the histopathologic findings of patients with post-scabieticnodules. While IgM was only raised during active scabies which does indicate active infestation. Hence in cases where is suspicion whether patients had cured or not,measuringIgE and IgM might give the answer.

References

[1]. Sharquie, K.E. and S.A. Al Ameer, Post-scabietic allergic nodules, Clinical and Histopathological study. J. Pan Arab League of Dermatology, 1997. **8**: p. 29-35.

[2]. Walton, S.F. and F.I. Oprescu, Immunology of scabies and translational outcomes: identifying the missing links. Curr Opin Infect Dis, 2013. **26**(2): p. 116-22.

[3]. Walton, S.F., The immunology of susceptibility and resistance to scabies. Parasite Immunol, 2010. **32**(8): p. 532-40.

[4]. Walton, S.F. and B.J. Currie, Problems in diagnosing scabies, a global disease in human and animal populations. Clin Microbiol Rev, 2007. **20**(2): p. 268-79.

[5]. Dahl, M.V., The immunology of scabies. Ann Allergy, 1983. **51**(6): p. 560-6.

[6]. Nassef, N.E., et al., Humoral and cell mediated immune responses in scabietic patients. J Egypt Soc Parasitol, 1991. **21**(3): p. 765-70.

[7]. Walton, S.F., et al., Increased allergic immune response to Sarcoptes scabiei antigens in crusted versus ordinary scabies. Clin Vaccine Immunol, 2010. **17**(9): p. 1428-38.

[8]. Sharquie, K.E., et al., Clinical and Sequential Histopathological Study of Scabietic and Postscabietic Nodules. THE IRAQI POSTGRADUATE MEDICAL JOURNAL, 2013. **12**: p. 693-699.

[9]. Kenawi, M.Z., et al., Clinical and parasitological aspects on human scabies in Qualyobia Governorate, Egypt. J Egypt Soc Parasitol, 1993. **23**(1): p. 247-53.

[10]. Senol, M., et al., Serum Immunoglobulin and Complement Levels in Scabies. Journal of Turgut Özal Medical Center, 1997. **4**: p. 37–39.

[11]. Roberts, L.J., et al., Crusted scabies: clinical and immunological findings in seventy-eight patients and a review of the literature. J Infect, 2005. **50**(5): p. 375-81.

[12]. Kenawi, M.Z., et al., Treatment of human scabies by sulfur and permethrin. J Egypt Soc Parasitol, 1993. **23**(3): p. 691-6.
[13]. Falk, E.S., Serum immunoglobulin values in patients with scabies. Br J Dermatol, 1980. **102**(1): p. 57-61.
[14]. Morsy, T.A., et al., Serum levels of tumour necrosis factor alpha (TNF-alpha) versus immunoglobulins (IgG., IgM., and IgE.) in Egyptian scabietic children. J Egypt Soc Parasitol, 1995. **25**(3): p. 773-86.
[15]. Morsy, T.A., et al., Serum immunoglobulin and complement values in scabietic patients. J Egypt Soc Parasitol, 1993. **23**(1): p. 221-9.