Autoimmune study in toxoplasmosis women

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Abstract

The effecting of toxoplasmosis in production of autoantibodies was studied through three markers, anti-nuclear antibody (ANA), anti-neutrophil cytoplasmic antibody (ANCA) and rheumatoid factor (RF). The immunofluorescent technique (IFAT) was used to estimated the ANA and ANCA, It was found that 9.8% and 5.5% of toxoplasmosis patients had ANA and ANCA respectively, but with no significant differences ($P>0.05$) when comparing with control group of each one. RF was tested by LAT and revealed that 10% of both infected women and healthy controls had antibodies against RF with no significant differences ($P>0.05$) between them.

Introduction

Several causes may lead to trigger of autoimmune diseases and the infectious agents are one of these important causes, so the relationship between infections and autoimmune disease has been studied extensively over many years and described the association between microbiological infection (bacterial, viral and parasite) and development of autoimmunity (14,2). The identification of microbial peptides that similar to self- tissue by molecular mimicry is a true factor that inducing or promoting autoimmune diseases triggering

by certain infections (2). According to these association between the infectious agents and autoimmune triggering, this study suggests to identify the relationship between *T. gondii* infection and autoimmune response throughout investigate the presence of some auto antibodies which are anti-nuclear antibody (ANA), anti-neutrophil cytoplasmic antibody (ANCA), and rheumatoid factor (RF) in the serum of toxoplasmosis patients.

Materials and methods

Serum samples were collected from healthy individuals as a control group and toxoplasmosis women after tested by ELISA (IgG and IgM) test when attended to hospitals in AL-Najaf and AL-Qadissyha provinces in Iraq, from September 2008 to February 2009. Then these serum samples were subjected to tested with different three markers to identify the presence of auto antibodies, as the following:

1-Anti-nuclear Antibody (ANA), [Hep-2 IFAT]

1- Anti- Nuclear Antibody (ANA):

Out of 51 toxoplasmosis cases, only 5(9.8%) cases showed positive ANA by immunofluorescent technique using HEP-2

Fifty one sera from patients of toxoplasmosis and thirteen sera from healthy women were involved in this test.

2-Anti-neutrophil Cytoplasmic Antibody, (ANCA), [IFAT]

Thirty six sera from patients of toxoplasmosis and 12 sera from healthy women were involved in this test.

3-Rheumatoid Factor (RF), [LAT]

Thirty eight sera from patients of toxoplasmosis and 10 sera from healthy women were involved in this test.

Results

substrate, among 13 controls no one (0%) was given positive ANA. (Table 1&Figure 1).

Table (1): ANA Patterns in Toxoplasmosis and Control.

	No.	positive	%	negative	%
Toxoplasmosis cases	51	5	9.8	46	90.2
controls	13	0	0	13	100
$X^2 = 1.4$ df = 1 P = 0.24

Fig.(1): Positive ANA on HEP-2 Cells (x40)

2-Anti- Neutrophil Cytoplasmic Antibody (ANCA):

Out of 36 toxoplasmosis cases, Only 2 (5.5%) patients gave positive ANCA by

immunoflurescent technique, no positive ANCA result was detected among the controls (Table 2&Figure 2).

Table (2): ANCA Seropositivity in Toxoplasmosis Cases and Controls According to Staining Pattern.

	No.	positive	%	negative	%
Toxoplasmosis cases	36	2	5.5	34	94.5
controls	12	0	0	12	100
$X^2 = 0.7$ df = 1 P = 0.4

Figure (2):Positive ANCA on Neutrophil Cells(x40)

3- Rheumatoid Factor (RF) :

By latex agglutination test, only 4 (10.5%) of 38 toxoplasmosis patients

revealed positive RF, and one (10%) of 10 healthy women gave positive result (Table 3).

Table(3): RF Seropositivity in Toxoplasmosis Cases and Controls

	No.	RF			
		positive	%	negative	%
Toxoplasmosis cases	38	4	10.5	34	89.5
controls	10	1	10	9	90
$X^2 = 0.002$ $df = 1$ $P = 0.96$					

Discussion

Infectious agent continues to be among the leading cause of morbidity and mortality worldwide. In addition, they are also implicated in the pathogenesis of in direct consequences such as induction of the autoimmune diseases (4,6,7). In the present study, five markers were examined to determine the autoimmune response in toxoplasmosis patients.

1- Anti- nuclear Antibodies (ANA):

By immunofluorescent technique using HEP-2 cells as substrate, the study revealed that out of 51 serum samples of toxoplasmosis patients, only 5 (9.8%) showed positive ANA. The difference of ANA seropositivity was non significant between patients and healthy control groups ($P > 0.05$). The result revealed a negative correlation between toxoplasmosis and ANA in Iraq, and this result was corresponding the results in Poland and Egypt (11,12) when both confirmed that, the toxoplasmosis do not play essential roles in generating the ANA. High ANA in sporadic case with toxoplasmic pericarditis was reported (9) and suggested that toxoplasmosis may play role in some cases of autoimmune diseases.

2-Anti- neutrophil Cytoplasmic Antibody (ANCA):

By IFAT, the study revealed that among 36 serum samples of toxoplasmosis patients, 2 (5.5%) showed positive ANCA. This result is more than that obtained by (5) who detected ANCA in 1/44 (2.3%) of

toxoplasmosis patients. In addition ANCA was not detected among 12 healthy women and this is consistent with (5) and (1) they confirmed that, no positive ANCA among 85 and 17 healthy controls respectively. The differences of positive ANCA was not statistically significant between patients group and healthy control group ($P > 0.05$). ANCA are characteristic marker of small vessels vasculitis and these autoantibodies have the ability to activate neutrophils, monocytes and endothelial cells in vitro (13). Therefore, ANCA may play an important role in the pathogenesis of glomerulonephritis, which represents a rare complication of toxoplasmosis.

3- Rheumatoid factor (RF):

The seropositivity of RF was estimated for 38 patients with toxoplasmosis by latex agglutination test, and 4 (10.5%) of those patients showed positive results for RF. The difference was not significant between patients group and healthy control group ($P > 0.05$), the result revealed that there is no correlation between toxoplasmosis and RF in this study. This result was compatible with (12) who mention that no significant relationship between toxoplasmosis and RF. (3,8,10) confirmed that, the elevated of RF level in some toxoplasmosis patients was due to false positive results and cross reactivity between *T. gondii* and RF occurring in certain tests.

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دراسة المناعة الذاتية لدى النساء المصابات بداء المقوسات

الخلاصة

تم دراسة تأثير داء المقوسات في إنتاج الأجسام المضادة الذاتية وذلك من خلال ثلاثة واسمات (markers) هي الجسم المضاد للنواة (ANA) والجسم المضاد لسيتوبلازم الخلايا العدلة (ANCA) وعامل الروماتزم (RF). استخدمت طريقة التآلق المناعي (IFAT) في تحديد الأجسام المضادة للنواة والأجسام المضادة لسيتوبلازم الخلايا العدلة، ووجد أن 9.8 % و 5.5 % من مريضات داء المقوسات لديهن الأجسام المضادة للنواة والأجسام المضادة لسيتوبلازم الخلايا العدلة على التوالي ولكن بدون فرق معنوي (تحت مستوى احتمال 0.05) عند مقارنة هذه النتائج مع مجموعة السيطرة. أما عامل الروماتزم فقد حدد باستخدام فحص التلازن لاتكس والذي أشار إلى أن 10% من النساء المصابات وكذلك الصحيحيات في مجموعة السيطرة لديهن الأجسام المضادة لعامل الروماتزم مع عدم وجود فرق معنوي (تحت مستوى احتمال 0.05) بين المجموعتين.