

ASSESSMENT OF IL-8, IL-10 AND TNF- α AMONG PREGNANT WOMEN INFECTED WITH ACUTE TOXOPLASMOSIS

Hala Yaseen Kadhem¹ and Entisar Mahdi Hamad^{2*}

¹Department of Anatomy, College of Medicine, University of Diyala, Iraq.

²Department of Nursing, Technical Institute Baquba, Central Technical University, Iraq.

*e-mail: entisarmahdi198080@gmail.com

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ABSTRACT : *Toxoplasma gondii* is one of the most important causes of a global parasitic disease (Toxoplasmosis). To determine the serum levels of IL-8, IL-10 and TNF- α the present study was done. It involved 30 women with repeated abortion and proved with toxoplasmosis, who they were attended to Al- Batool Hospital, Baquba, during the period from October-2013 till the end of September 2014. The level of IL-8 showed significant elevation ($341 \pm 0,41$ pg/ml, $P = 0.005$) in infected women compared to control (120.2 ± 0.63 pg/ml) group. The level of IL-10 in serum of infected women were significant decrease (69.3 ± 3.56 pg/ml, $p=0.03$) compared with control and the level of TNF- α was significant increase in women infected with acute toxoplasmosis (40.4 ± 1.9 pg/ml, $p=0.05$) in comparison to control group. The present study concluded that there is high inflammatory response in women infected with acute toxoplasmosis.

Key words : Acute toxoplasmosis, cytokines, pregnant women

INTRODUCTION

Toxoplasma gondii is one of the most important causes of a global parasitic disease (Toxoplasmosis), it is widely distributed in the world as it infects approximately 30 to 50 percent of the world's population (Flegr *et al*, 2014). *Toxoplasma gondii* can infect any organ of the body, including the brain and muscle where it surrounds itself with a capsule that protects it from immune response resulting in a latent infection (Dupont *et al*, 2012). However, the immunity against *T. gondii* initiates from a many types of cell-mediated immune response such as inflammatory cells (monocytes and lymphocytes), macrophages, and cytokines (Berrett *et al*, 2018). Macrophage and other cells (such as epithelial cells) produce Interleukin (IL-8), which is induces chemotaxis of neutrophils and other granulocytes to migrate to the site of infection (Flegr *et al*, 2014). While IL-10 prevents cytokine synthesis and by inhibiting the production of IL-6 and TNF- α . Many of cytokines play a role in the resistance to acute and chronic infection of *T. gondii* during pregnancy (Aldabagh *et al*, 2018). Some studies documented the important role of IL-10, IL-12 and TNF- α the innate immunity against *T. gondii* and influence the adaptive immune response; these cytokines are important immunomodulators that act during the early stage of infection (Mohamed *et al*, 2017; Sher *et al*, 2017). This study designed to determine the serum levels

of IL-8, IL-10 and TNF- α .

MATERIALS AND METHODS

This study involved 30 women with repeated abortion and proved with toxoplasmosis (mean of ages is 16.76 ± 4.61 years with age ranged 10- 34 27.43). They were attended to Al- Batool hospital, Baquba during the period from October-2013 till the end of September 2014. Samples of control group were collected from 29 women fertile healthy married women (not pregnant) their ages mean was 28 ranged from 17 to 44 years. From each woman, 5 ml of venous blood was collected in plan tubes. Separated serum were divided into many aliquots in Eppendorf tubes and kept at -20°C till the tests of immune factors were performed. The ELISA Toxo-IgM and Toxo-IgG Anti- *Toxoplasma* antibodies kits (Human-Germany) were used according to manufactures instruction to confirm the infection with toxoplasmosis. Enzyme-linked immunosorbent assays (ELISA) were used to evaluate serum levels to each of IL-8, TNF- α AND IL-10 (PeproThech, USA), The current study was approved by Research Ethical Committee of Baquba Teaching Hospital. All the women were provided with written informed consent to Participates in this study.

Statistical analysis

SPSS program (version 20) were used for analyzing all data. To compare the mean of cytokines between

patients and control, t-test was used. Levels of measured cytokines expressed as (Mean±Standard error). Significance in all tests was set at 0.05 ($P \leq 0.05$).

RESULTS

The ELISA Toxo-IgM and Toxo-IgG Anti-Toxoplasma antibodies tests confirm that all infected women had positive result for both acute and chronic infection with toxoplasmosis. Statistical analysis of the present results showed normal distribution checked with normality test as shown in Table 1.

The level of IL-8 showed significant elevation (341 ± 0.41 pg/ml, $P = 0.005$) in infected women compared to control (120.2 ± 0.63 pg/ml) group (Table 2). The level of IL-10 in serum of infected women were significant decrease (69.3 ± 3.56 pg/ml, $p=0.03$) compared with control and the level of TNF- α was significant increase in women infected with acute toxoplasmosis (40.4 ± 1.9 pg/ml, $p=0.05$) in comparison to control group (Table 2).

Table 1 : Distribution of subjects in studied groups.

Groups	No.	Percentage (%)	P-value
Patients	30	50.85	5.833
Control	29	49.15	
Total	59	100	

Table 2 : Cytokines levels in acute toxoplasmosis infected women compared to control group

Groups	No.	Mean±S.E. (pg/ml)		
		IL-8	IL-10	TNF- α
Patients	30	341.10 ± 0.41	29.01 ± 2.01	128.98 ± 0.50
Control	29	120.2 ± 0.63	69.3 ± 3.56	40.4 ± 1.9
P - value	5.833	0.005	0.03	0.05

DISCUSSION

There is increase in the IL-8 level in the current study this may revealed increasing of inflammatory response in aborted women and this may lead to attract of lymphocyte and neutrophil. This agrees with Aldabagh *et al* (2018) and Ali (2016), who found that IL-8 was significantly increased in acute with early acute inflammation or with a reactive from toxoplasmosis. Also, this results agree with Zicari *et al* (2002), who mentioned that inflammatory cytokines including IL-8 might play an important role in induced neurogenic inflammation leading to abortions by enrolling neutrophils and lymphocytes in the endometrium (Zicari *et al*, 2002). On the contrary, Koumantaki *et al* (2001) mentioned that women with recurrent abortions had decreased in plasma level of IL-8 compared to those with normal pregnancies. IL-10 prevents cytokine synthesis by inhibiting the production of IL-6 and TNF- α . In the present study the level of

TNF- α was increase while the level of IL-10 was decrease. TNF- α is a Th1 response cytokine produced by macrophage, T-lymphocyte, basophils and monocytes. The induction of a type 1 inflammatory cytokine (IL-12, TNF- α and IFN- γ) response is a key event in the initiation of immunity to *T. gondii* (Pomares *et al*, 2017). Cytokines have been shown to play an important role in the pathogenesis of toxoplasmosis. IL-10 plays an important role in the balance between protective immunity and the development of immune pathology. IL-10 has been shown to act in the down-regulation of IFN- γ in infection with *T. gondii*, in mice (Wilson *et al*, 2005; Dogruman *et al*, 201). It is well known that IL-10 also inhibits the production of IL-12, TNF- α and IL-6 and that *T. gondii* infection is dominated by a strong type 1 response (12). This may explain the increase of TNF- α when IL-10 decrease in the present study. The present study concluded that there is high inflammatory response in women infected with acute toxoplasmosis.

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