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The Role of IL8 and IL17A in thalassemia patients infected with toxoplasmosis in Diyala province

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KEY WORDS:
Toxoplasmosis, Thalassemia,IL8, L17A

ABSTRACT

Background: *Toxoplasma gondii* is an obligate intracellular protozoan parasite, a unicellular eukaryote that resides within host cells and impacts around one-third of the global population, particularly patients that are immunocompromised.

Aim: To evaluate the importance of IL8 and IL17A in serum of the thalassemia patients infected with *T.gondii* .

Patients and methods : This study conducted on 50 thalassemia patients and 25 sample collected from healthy people as a control group . During the period from May 2024 to December 2024 .

Results: A significant difference (P≤0.01) has been found in value of IL8 and IL17A in thalassemia patients infected by toxoplasmosis compared with control group. We have been recorded increased the mean level of both IL8 and IL17A in thalassemia patients with toxoplasmosis compared with control group.

Conclusions: The serum mean levels of pro-inflammatory cytokines such as IL8 and IL17A appear to be elevated in thalassemia patients with serological evidence of *T.gondii* infection.

Keywords: Toxoplasmosis,Thalassemia,IL8, L17A

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INTRODUCTION:

Toxoplasma gondii is an intracellular parasite with aworldwide prevalence among warm-blooded animals and humans[1] . Humans are mostly infected through ingestion of water or food, which is contaminated with oocysts shed by cats or by eating raw or undercooked meat containing *T. gondii* tissue cysts [2] . Also toxoplasmosis can be transmitted via organ transplantation,whole blood or white blood cells transmited from infected donor [3] . In healthy individuals, the infection is usually self-limiting and asymptomatic[4] .

Toxoplasmosis in immunocompromised individuals, such as cancer patients, organ transplant recipients, and those with HIV/AIDS, can be a life-threatening risk with potentially deadly outcomes [5] . IL8 is proinflammatory cytokine produced by macrophages and other cell types such as epithelial cells and endothelial cells and has an important role in the innate immune response[6] . IL-17A, one of the initial cytokines in response to bacterial and parasitic infections, is predominantly generated by Th17 cells [7] .

Patients and Methods

Fifty blood samples were obtained from thalassemia patients in the Hematology center. The blood samples were suitably kept and analyzed for IL8 and IL17A Briefly 3ml of venous blood was withdrawn from each patient by means of sterile syringes and was evacuated in a plain tube. Then blood samples was centrifuged at 4000 rpm for five minute to collect serum which was examined using Enzyme-linked immunosorbent assay (ELISA) technique, the samples were placed in a eppendrof tube and marked by number with all profile patient and stored at (-20 ℃).

Ethical approvement:

Approval number 22187 on 19/5/2024 informed permission was provided by the Ministry of Health and the University of Tikrit/College of Medicine.

Statistical analysis:

Statistical analysis was carried out using SPSS version 23 (SPSS, IBM Company, Chicago, USA). Categorical variables were presented as frequencies and percentage and correlation test used . Quantitative data were expressed as mean ± standard deviation, with their 95% confidence interval. A NOVA was used to compare between means of variables value of P value <0.05was regarded as statistically significant .

Results:

The results presented in **Table** (1) reveals that the mean IL8 level in thalassemia patients infected by toxoplasmosis was 104.75± 26.18, compared to the mean level in healthy individuals was 40.33± 10.08 . Statistical analysis revealed significant differences (P≤0.01) between the groups.

Table (1): The mean level of IL8 of positive patients with *T.gondii* among thalassemia patients compared with healthy individual

Studying group	IL8	P.value
Positive patient	104.75± 26.18	P≤0.01
Control group	40.33± 10.08	

The results presented in **Table** (2) reveals that the mean IL17A level in thalassemia patients infected by toxoplasmosis was 545.75± 136.43, compared to the mean level in healthy individuals was 348.24± 87.06. Statistical analysis revealed significant differences (P≤0.01) between the groups.

Table (2): The mean level of IL17A of positive patients with *T.gondii* among thalassemia patients compared with healthy individual

Studying group	IL17A	P.value
Positive patient	545.75± 136.43	P≤0.01
Control group	348.24± 87.06	

Discussion:

The results presented in **Table** (1) reveals that the mean IL8 level in thalassemia patients infected by toxoplasmosis was 104.75± 26.18, compared to the mean level in healthy individuals was 40.33± 10.08 . Statistical analysis revealed significant differences (P≤0.01) between the groups. The elevated mean levels of interleukin-8 (IL-8) in thalassemia patients infected with *Toxoplasma gondii* can be linked to various immunological and pathological factors like chronic inflammation in thalassemia patients due to iron overload, frequent blood transfusion and oxidative stress this leads to standard activation of immune cells, including monocytes and macrophages, which can contribute to elevated cytokine levels, including IL8 [8]

IL-8 is a pro-inflammatory cytokine that plays an essential part in attracting neutrophils and other immune cells to sites of infection[9] . Excess iron in thalassemia patients may facilitate pathogen proliferation and immunological dysfunction[10] . The increased IL-8 mean levels in thalassemia patients with toxoplasmosis result from a combination of chronic inflammation, immune activation by *T. gondii*, and iron-mediated immune dysregulation. The increased inflammatory response may exacerbate disease severity in co-infected patients[8]. This our results line up with another study conducted in Baghdad on thalassemia patients[11] .

The results presented in **Table** (2) reveals that the mean IL17A level in thalassemia patients infected by toxoplasmosis was 545.75± 136.43, compared to the mean level in healthy individuals was 348.24± 87.06. Statistical analysis revealed significant differences (P≤0.01) between the groups.

The increased mean level of IL17A in thalassemia patients with toxoplasmosis is due to several pathological and immunological reasons as iron overload and it considered activated growth factor for certain microbes can alter immune responses, favoring Th17 activation so lead to IL17A production because of thalassemia patients often have immune dysregulation, including altered T-cell responses[12] . The results of our research aligned with another investigation carried out in Kufa, Iraq, on thalassemia patients[13] .

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