

Role Of Interleukin 17 A In *Entamoeba Histolytica* Patients Of AL Najaf Al Ashraf City

Raad Ajam Sayl¹, Nada Ahmed Abbas²

^{1,2}Collage of Health and Medical Technology / kufa, Al-Furat Al-Awsat Technical university

Email¹: dr.raadajem@gmail.com

Email²: na54341@gmail.com

Abstract

Amebiasis caused by *E. histolytica* varies greatly in presentation and can range from asymptomatic colonization to mild diarrhea to dysentery. *Entamoeba histolytica* is one of the most important and broadly prevalent protozoan parasites, causing significant public health and health problems in developing countries. This study comprised 150 blood sample from both gender (75 blood sample from patient bloody diarrhea with *E.histolytica* and 75 blood sample from patient with diarrhea but no diagnosis *E.histolytica*) The result showed Serum level of IL-17 A in patient bloody diarrhea with *E.histolytica* and patient with diarrhea but no diagnosis *E.histolytica* .

Introduction

Amebiasis caused by *E. histolytica* varies greatly in presentation and can range from asymptomatic colonization to mild diarrhea to dysentery and finally to an invasive disease of the liver, lung, or brain (Verkerke *et al* .,2012).*Entamoeba histolytica* is one of the most important and broadly prevalent protozoan parasites, causing significant public health and health problems in developing countries (Fletcher *et al* .,2012).Severe infections inflame the mucosa of the large intestine causing amoebic dysentery. The parasites can also penetrate the intestinal wall and travel to organs such as the liver via blood stream causing extraintestinal amoebiasis(Al-Hadraawy *et al* .,2015). *E. histolytica* are often spread by contaminated food and or drinking water and possibly from person to person through fecal oral contact(Pham Duc *et al* .,2011). Symptoms may include bloody diarrhea, mild diarrhea ,tissue death, abdominal pain and peritonitis (Farrar *et al* .,2013).

Cell-mediated cytokines production (IFN- γ and IL-17) plays a crucial role in protecting against amebiasis (AL-Majid and Hafez, 2021). During infection with *E.histolytica* .a lectin found on the surface of the parasite that recognizes the sugars galactose (Gal) and N-acetyl-d-galactosamine (GalNAc) found in the membranes of host cells ,is responsible for the attachment of trophozoites to intestinal epithelial cells (GalNAc) (Martínez-Ocaña *et al.*, 2020).

Materials and methods

Patients Group

Samples collection (75 Stool sample and 75 blood sample) were collected in this study and during the period from (1/10/2022) to (30/2/2023) from all ages of patient from both sex (Males and Females). Every patient was reported though a specifically prepared questionnaire which included name ,gender, age ,living , Previous and address for every patient at (Al-Sader Medical City / AL-Haidarya general hospital / AL-Hakeem general hospital) and all aged taked All of the patients in this study filled out a direct questionnaire,

Control Group

which control group were 75 blood sample from Patient with diarrhea but not diagnosis *E.histolytica* . The control group was used only for comparing parameter. The control samples were approximately similar with the samples patients in terms of number, ratio of age , in addition to the

place of living also country side and city. Also, ask a special question sheet for the control samples.

Where blood was drawn from a vein to measure immunological parameters (IL-17A).

Samples Collection (stool and blood)

Collecting Stool Samples

Stool specimens were collected in a sterile, dry Container and transferred to the parasitology department for direct examination macroscopically and microscopically.

Blood Samples Collection

Patients who were diagnosed with having intestinal parasites had venous blood samples taken and Patient with diarrhea but without parasitic infection With a 3-ml medical syringe, the sample was transferred to clean plastic tubes and let to sit for a set amount of time before being centrifuged (3000 rpm) takes 20 minutes to extract serum from blood and put in eppendroff and then placed in the freezer at -20 degrees Celsius to freeze within 4 hours of collection for immunological tests by ELISA.

Test Interleukin 17A (IL-17A) ELISA Kit

Standard Curve of Interleukin 17A

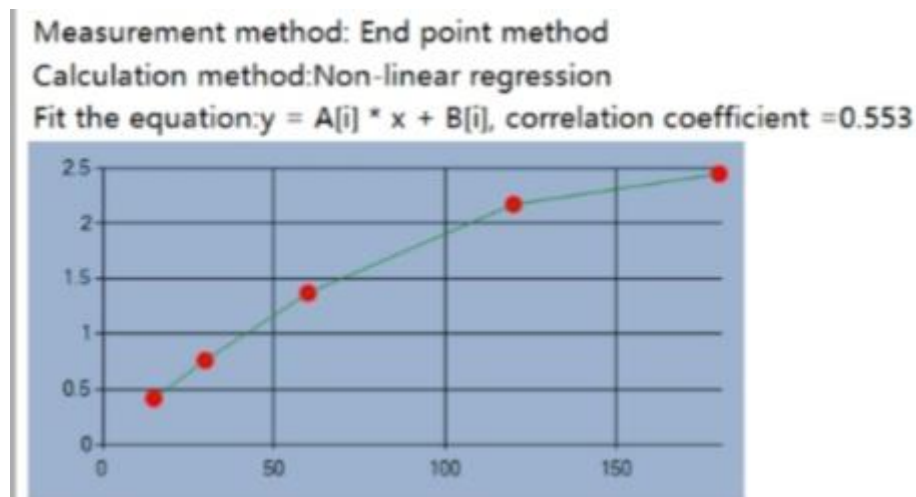


Figure 3.4: Standard Curve of Interleukin-17A

Result

Table (1): sociodemographic characteristics of respondents for both groups

mean ± Std		33 ± 12.286	66 ± 11.984	value
ables		s	rol	
Groups (Years)				
				14
	6			
	6			
	6			
	6			
	6			
	l	0	0	
der				142
	ale			
	l	0	0	

Age groups				
Age	Group			0.027
Age	Group			
Age	Group	0	0	
Previous Infection				
Previous	Infection			0.001
Previous	Infection			
Previous	Infection	0	0	

*t -test, significant at 0.05.

** Mann-Whitney

Table (2): T-test comparison between study groups according to the IL7 A

Group	Mean	Standard Deviation	Error Mean
Study Cases	646	3930	774
Study Control	830	7407	629
F-test for Equality of Variances			
			Significant
Study Cases	variances	4	0-
Study Control	variances not		0

Table (3): Regression Coefficients for the relationship between I.L. 17A and the previous infection for both groups

Coefficients^a						
Model	Variable	Standardized Coefficients	Standard Error	t-Statistic	df	Significance
1	(Constant)	1				
	Previous Infection					
2	(Constant)	8				
	Previous Infection	9	0			

a. Dependent Variable: TGF beta

b. Predictor

c. *Significant at level 0.05.

Discussion

The current study result in table(1) shows that most of the respondents (29.3%) were in the age group (27-36 years) for the study cases group, this agree with result mentioned in the studies that were recently published, as it proved that Amoebiasis most commonly affects young to middle-aged adults (Kumanan *et al.*, 2020 ; Chou and Austin, 2020 ; Ngobeni *et al.*, 2022).

The effect of spreading of *E.histolytica* in young to middle-aged adults occurs for travellers to countries with poor sanitation (developing countries) (Chou and Austin, 2020).

For the study control group,if also be found the same result in the same condition. At the same time, there isn't a statistically significant difference between groups (0.051); this design confirms this result.

As for gender, the males in the study group (cases group) were more than females (58.7%); however, in the study group (control group), the females (53.3%) were more than males. Also, there isn't a statistically significant difference between groups (0.14) this result was confirmed by Saafa and Al-

Kaeebi, (2017) who reported that 58.3% of males and 41.6% of females in Al-Qadisiyah provinc were infected.

The result mention by Mohammed *et al.*, (2022) in Sulaymaniyah Governorate , and they also mentioned that , that males recorded a higher infection rate was (17.7%), while the female was (14.3%), ($p > 0.05$) and this result was not a statistically significant difference thus this distribution was compatiple with our distribution of respondents according gender.

The differences in infection rates between males and females might be caused by the different according social behavior and working time t, between the two gender , as males normally are the working sex, in the society .which made them in contact with the environment .(Al-Hilfi *et al.*, 2021).

According to the living area, the respondents from urban were more than the rural area for both groups. The groups do, however, differ significantly from one another (0.026). For the previous infected history, this result shows that the fact more respondents in the cases group were negative (70.7%), and there is a the existence of a statistically significant distinction between groups (0.001).

Mohammed *et al.*, (2022) mentioned that Prevalence in rural (20.3%), in ,urban (13.8%) , ($p < 0.05$). and this un compatiple with our distribution of respondents according of residence .

Table (2) show result of current study IL-17A concentration level was increased and overexpressed in patients with *E.histolytica* in compared , with the profile observed in the control group (negative group) (Gonzalez Rivas *et al.*, 2018). These results contradict what was reached in our current study, the level of IL-17A concentration in amoeba patients showed our results (Mean± Std.Deviation 22.31646 ± 11.853930) is lower than, that of the control group (Mean± Std.Deviation 31.81830 ± 38.777407).

Our findings supports the data of Hikmah, (2022) regarding , the effects of IL-17A, This cytokines is important in the control of *E. histolytica* infection.

Also our results of the present study ,don't agree with Nhidza *et al.*, (2020), where mentioned that in the group of patients with *E.histolytica* infection, IL17A and $TNF\alpha$, two cytokines, both showed elevated levels in their concentration, in comparision with control group and The immune response was shown to have a proinflammatory profile nature by this.

The result of this table (3) shows ,that there is a regression relationship a weak relationship between IL-17A and the previous infection (0.22), and 12.5% of cases can predict them using IL-17A for cases. However, there is a weak regression relationship between IL-17A and the previous infection (0.04), and 8.9% of the control group can predict them using IL-17A interleukin.

The primary effector function of IL-17 is neutrophil accumulation and IL-17, although its primary effector function is to recruit neutrophils and boost productionof proinflammatory cytokines and antimicrobial peptides (Valeri and Raffatellu, 2016).

Studies of amoebiasis infections show that Th17 cells mediate host defense by limiting parasite invasion and multiplication. Patients with infections had higher than normal levels of IL-17, which was linked to more effective neutrophil and macrophage killing of the parasite (Samanta, 2023).

Despite IL-17A has protective effect against *E.histolytica* infection, There is clear evidence that IL-17 has a The harmful effect , as IL-17 neutralization provides some protection against the deadly disease, by balancing the heightened inflammation caused by IL-17 with the co-production of IL-10 and $IFN-\gamma$. Together, these studies contradict previously published studies and add to the growing body of evidence supporting IL-17's pathological role in parasite infections. Therefore, it is still unclear whether IL-17 plays a protective or pathologic role during parasitic infection (Deloer *et al.*, 2017).

References

Verkerke, H. P., Petri, W. A., & Marie, C. S. (2012, November). The dynamic interdependence of amebiasis, innate immunity, and undernutrition. In *Seminars in immunopathology* (Vol. 34, pp. 771-785). Springer-Verlag.

- Fletcher**, S. M., Stark, D., Harkness, J., & Ellis, J. (2012). Enteric protozoa in the developed world: a public health perspective. *Clinical microbiology reviews*, 25(3), 420-449.
- Al-Hadraawy**, S. K., Al-qraby, M. E., & Shebly, F. M. A. (2015). Study of Some Parameter in Men Infected with Entamoeba histolytica in Al-Najaf Al-Ashraf Province. *Journal of University of Babylon*, 23(2).
- Pham Duc**, P., Nguyen-Viet, H., Hattendorf, J., Zinsstag, J., Dac Cam, P., & Odermatt, P. (2011). Risk factors for Entamoeba histolytica infection in an agricultural community in Hanam province, Vietnam. *Parasites & vectors*, 4(1), 1-9.
- Farrar**, J., Peter, J., Hotez, T., Gagandeep, K., David, L., and Nicholas, J. 2013. Manson's Tropical Diseases Elsevier Health Sciences. pp:664-671. ISBN
- AL-Majid**, A. S. K., & Hafez, A. A. (2021). The Role of IL-25 and IL-35 in Amoebiasis. *Indian Journal of Forensic Medicine & Toxicology*, 15(1), 2760-2764.
- Martínez-Ocaña**, J., Maravilla, P., & Olivo-Díaz, A. (2020). Interaction between human mucins and parasite glycoproteins: the role of lectins and glycosidases in colonization by intestinal protozoa. *Revista do Instituto de Medicina Tropical de São Paulo*, 62.
- Ngobeni**, R., Ramalivhana, J. N., Traore, A. N., & Samie, A. (2022). Interleukin 10 (IL-10) Production and Seroprevalence of Entamoeba histolytica Infection among HIV-Infected Patients in South Africa. *Pathogens*, 12(1), 19.
- Chou**, A., & Austin, R. L. (2020). Entamoeba histolytica.
- Saafa**, R. S. S. A. D., & Al-Kaeebi, R. A. (2017). PCR conventional for detecting AP and PLA virulence Use factors of Entamoeba histolytica in patients stool samples in Al-Qadisiyah Province. *Journal Of Wassit For Science & Medicine*, 10(1).
- Mohammed**, H. S., Ali, S. A. K., Mohammed, L. O., & Mohammed, M. S. (2022). Prevalence of Amoebiasis and Estimation of Certain Cytokines (IL-17, IFN- γ and TNF- α) in Children with Amoebic Infection in Sulaimani Province/Iraq. *Iraq Medical Journal*, 6(1).
- Al-Hilfi**, A. A., Al-Malak, M. K., & Al-Tomah, M. A. (2021). A Prevalence study of Entamoeba spp. in Basrah Province using Different Detection Methods. *Baghdad Science Journal*, 18(4), 1163-1163.
- Mohammed**, H. S., Ali, S. A. K., Mohammed, L. O., & Mohammed, M. S. (2022). Prevalence of Amoebiasis and Estimation of Certain Cytokines (IL-17, IFN- γ and TNF- α) in Children with Amoebic Infection in Sulaimani Province/Iraq. *Iraq Medical Journal*, 6(1).
- Gonzalez Rivas**, E., Ximenez, C., Nieves-Ramirez, M. E., Moran Silva, P., Partida-Rodríguez, O., Hernandez, E. H., ... & Magaña Nuñez, U. (2018). Entamoeba histolytica calreticulin induces the expression of cytokines in peripheral blood mononuclear cells isolated from patients with amebic liver abscess. *Frontiers in cellular and infection microbiology*, 8, 358.
- Hikmah**, Z. (2022). Amebiasis Vaccine. *International Journal of Science and Research (IJSR)*, 11(9), 202-203.
- Nhidza**, A. F., Naicker, T., Stray-Pedersen, B., Chisango, T. J., Sibanda, E. P., Ismail, A., ... & Mduluzza, T. (2020). Immune response to asymptomatic infections by Entamoeba histolytica and other enteric pathogens in pregnant women and their infants in a high HIV burdened setting in Zimbabwe. *Journal of Microbiology, Immunology and Infection*, 53(4), 612-621.
- Valeri**, M., & Raffatellu, M. (2016). Cytokines IL-17 and IL-22 in the host response to infection. *Pathogens and disease*, 74(9), ftw111.
- Samanta**, S. (2023). Mechanisms of gastrointestinal pathogenesis and landscape of intestinal immunity. In *Viral, Parasitic, Bacterial, and Fungal Infections* (pp. 863-913). Academic Press.
- Deloer**, S., Nakamura, R., Kikuchi, M., Moriyasu, T., Kalenda, Y. D. J., Mohammed, E. S., ... & Hamano, S. (2017). IL-17A contributes to reducing IFN- γ /IL-4 ratio and persistence of Entamoeba histolytica during intestinal amebiasis. *Parasitology international*, 66(6), 817-823.