Study of Some Immune Changes That Related to Leishmania (CL) Infection

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Abstract. *Cutaneous leishmaniasis is an infection of the skin. The symptoms graduated causes bumps that after that turn into ulcers (large) in the future. Healing may take a long time. Symptoms begin within weeks or may be months after bite of sand fly.This study was conducted in the city of Hilla. This study included 90 patients who were selected from visitors to private clinics. These study participants were then divided into two groups of similar ages. The first group included 60 people with cutaneous leishmaniasis who were diagnosed by a doctor, in addition to a second group that included 30 people who were not infected with any disease as a control group. Cytokine concentrations were also measured using... ELISA technique, then statistical testing was performed. Results: showed high concentration of the cytokines that were under study interleukin 17 and interleukin 33 in the patient group compared to the group of control. Conclusions and recommendations: The increase in the level of cytokines in the patient group may indicate the role that these cytokines play in the regression of the disease*

Keywords *– Cutaneous leishmaniasis, cytokines, interleukin-17, interleukin-33, ELISA*

I. INTRODUCTION

Leishmania parasites are single-celled organisms that are so small that they can only be seen using a microscope. The two most common kinds are Leishmaniasis affecting the skin, and visceral leishmaniasis. (Gruel et al 2020). Leishmaniasis divided into three types: mucosal, cutaneous and visceral.(David and Craft , 2009).

it remains on its own and symptoms begin a few weeks or months after the sand fly bite.(Handler, et al 2015).

The strategy used in treating the disease is through the cellular response rather than the humoral immune response. It has been found that there is a strong correlation between T cell activation and the outcome of the disease (Alexander and Brisson, 2005). Helper T cells 17 are T cells that carry CD4+ on their surface, and produce interleukin 17. Among their characteristics are that they are highly inflammatory and also stimulate the production of monocytes, epithelial cells, and endothelial cells. One of the roles played by interleukin 17 (IL-17) is to stimulate fibroblasts and endothelial cells(Hussein et al 2015). There are several previous studies that evaluated immune mediators in leishmaniasis infection of CL, but few studies mention the role of IL-17 (Ghazanfari et al 2022).

Scratching is a type of skin damage caused by an allergen and inflammation leads to cell necrosis which subsequently leads to the releases of IL-33, After that , it will bind to ST2L present on a number of skin cells. IL-33 may stimulate dendritic cells (DCs) of naive CD4+ T cells to transform into Th2 and then produce cytokines such as interleukin-10, interleukin-5 and interleukin-13.

IL-33 can also strongly activate innate immune cells (MCs) and thus also lead to the release of mediators such as prostaglandins, histamine, and other mediators. IL-33 can stimulate chemokine and then neutrophil recruitment (N). high level of cell of Th17 type associated with IL 17 which due to IL-33 (Miller 2011).

II. METHODS

60 patients infected with cutenous leishmania. They had participated in study, Their ages ranged from (25-35 years), that attended the specialized clinic, suffering from symptoms of cutaneous leishmanisis In addition 30 matched apparently healthy volunteers with no history of toxoplasmosis were selected as a control group. Five milliliters of blood were drawn from the vein of the subjects by specialists in the drawing process from each patient as well as from the group of healthy subjects, after that sample was dispensed in the sterile plain tubes and left for about 1/2 hours until clot formation, and then put in centrifuge at 1000 r.p.m for 5 minutes in temperature of room until the serum was separate. Then it is distributed inside sterile Eppendorf tubes, then tightly closed and stored at -20°C until the required tests are performed on the sample.

III. RESULT AND DISCUSSION

Interleukin -17 (IL-17 A)

Regarding the results of the IL- 17 in patients with cutaneous leishmaniasis, it showed high level of IL- 17 in the patient group at a significant level (P<0.05) (632.32 ± 21.34) compared to the control group, which showed a low level of concentration (513.03 ± 26.88) and as shown in Table No. (1)

Table (1) show level of IL-17 A in serum

Group	No.	Mean ± SD IL-17 pg/ml
Patients	60	632.32 ± 21.34 a
Control	30	513.03 ± 26.88 b
T-test	---	77.401 *
* (P<0.05).		

Interleukin -33 (IL-33)

Regarding the results of the IL- 33 in patients with cutaneous leishmaniasis, it showed high IL-33 concentration in the patient group at a significant level (P<0.05) (153.71 ± 34.18) compared (to the control group, which showed a low level of concentration (82.37 ± 13.29) and as shown in Table No. (2)

Table (2) show level of IL-33 in serum

Group	No.	Mean ± SD IL-33 pg/ml
Patients	60	153.71 ± 34.18
Control	30	82.37 ± 13.29
T-test	---	29.323 *
* (P<0.05).		

level of concentration (82.37 ± 13.29) and as shown in Table No. (2)

Discussion

Interleukin -17 A (Il-17 A)

There are many studies conducted on cutaneous leishmaniasis in Iraq, which addressed the role of cytokines and antibodies in skin infection with leishmaniasis. Among these studies is a study conducted in the city of Samarra, which found an increase in the level of interleukin 10 (abud al Aziz et al 2022). There was also another study in Iraq, especially Baghdad Governorate, which indicated the important role of cytokinins in recovery from cutaneous leishmaniasis (Al-Aubaidi, 2011) The interleukin 17 family contains 6 types of cytokines, it act as pro-inflammatory. In recent years, it has become clear that IL-17 plays a role beyond simply inducing inflammation. A growing body of evidence suggests that IL-17 plays an important role in maintaining health during the response to infection. There are two studies on this subject, one of them in Baghdad, which showed that interleukin 17 is associated with progression

of cutaneous leishmaniasis (Hussein et al 2015). While the other study conducted in Kirkuk, northern Iraq, indicated an increase in its level in the patient group

Interleukin -33 (IL-33)

There are few studies on the relationship of cytokines with skin infection with leishmaniasis, especially the relationship of infection with the parasite and this type of cytokines in Iraq. But there is a study conducted on mice and on the role of this family of cytokines in recovery from the disease. IL-33play important role in immune response from type Th-2 . Many studies have indicated its role in parasitic infections At the same time, many studies have indicated its role in skin infections (Miller, 2011). Therefore, it is believed that the high level of this cytokine in the patient group as compared to control may be due to its important role in recovery from injury.

CONCLUSION

The study high level of IL- 33, and IL-17 in the patient as compared to control. This increase in the level of cytokines may be due to the important role that cytokines play in recovery from the disease.

RECOMMENDATION

Study the relationship of these cytokines during different stages of the disease

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