



Evaluation of IL-27 Concentration in a Miscarriages Woman Infected with *Toxoplasma gondii*

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Abstract

Toxoplasmosis is one of the most common zoonotic pathogens worldwide; Immune response against this parasite was affected by synthesis of specific interleukins like IL-27. The major objectives of this study detection of prevalence expression of IL-27 among ninety-six miscarriages women were tested; forty-eight of them was with miscarriages due to toxoplasmosis and forty-eight apparently healthy pregnant women (with out of any miscarriages) were enrolled as a control group in Najaf governorate. Methodology: Descriptive case-control, purposive (probability) sample among ninety six miscarriages women were tested, attending in Central Health Laboratory .The data collected from January 2019 to September 2019. The concentration level of IL-27 in miscarriages women was measured by ELISA technique according to many parameters such as age, occupation, residence and number of miscarriages. The result indicated that the concentration of IL-27 was elevated in women with one or two miscarriages. The high concentration of IL-27 in infected miscarriages women with age group (20-24), (25-29). There was no significant differences in study groups according to occupation and there were differences in IL-27 concentration levels according to residency. It was demonstrated that the high concentration of IL-27 was appear in rural infected miscarriages women and low in urban miscarriages women with toxoplasmosis, results were analyzed by using statistical methods (Levene test, ANOVA test, t test). Conclusion: Interleukins (IL-27) play a significant role in immunity against infection with *Toxoplasma gondii*. Recommendation: Further studies are recommended to know the concentration of IL-27 among miscarriages women to be one of an important laboratory tests in the induction of immune response against this type of infection.

Keywords: *Interleukins IL-27, Toxoplasma gondii, Miscarriages women.*

Introduction

Toxoplasma gondii has a variety of distribution [1]. The opportunity of human infection is large as the cats are the biggest source of toxoplasmosis [2]. Human toxoplasmosis shows a broad range of clinical signs; most of them are asymptomatic especially in an immunocompetent patient [3]. The probability of transplacental infection was high in the late stages of pregnancy and proportion of incidence may reach to down (15%) but the seriousness in neonate very high if the women becomes infected during the first trimester [4].

T. gondii was important parasitic diseases especially in two groups: miscarriages women and immune-compromised women [5]. Chemokines and cytotoxic molecules such as nitric oxide were considered immune

substances that produce immediately after the occurrence of the parasite invasion resulting from the successful transition of infective stages from *T. gondii* to the patient [6]. IL-27 one of the members of the Th2 groups, which consists directly of concentric parts that act with unity of IL-12p40 [7]. The immune factors such as many kinds of cytokines like IL-4, IL-5, IL-10, IL-12, IL-22, IL-27 play very important role in human toxoplasmosis [8].

Oral infection with *T.gondii* may cause different types of inflammation dependent on the immune status. It was found high level of IL-27 concentration in the ileum of experimental infected mice with *T.gondii* [9]. IL-27 considered one of the most important immune factors that play a significant role in

the prevention of infection with toxoplasmosis [10].

Methodology

Study Sample

Ninety six serum sample of suspected patient were involved ,the women were 20-45 years of age. They were attending in central health laboratory in Najaf governorate. The data collected from January 2019 to September 2019.The age groups, number of miscarriages, occupation and address were depended in following of the study.

Control

Forty-eight apparently healthy pregnant women (with out of any miscarriages) were enrolled as a control group.

Specimen Collections

Blood samples: were drawn from each patient and control groups by disposable syringe 5ml of blood were collected in sterile serum tube and left for one hour at room temperature. Then, centrifuged at 3000rpm for (15) min.

To separate the serum that was stored at-20 C° until used.

IL-27.ELISA kit. (Cusabio, China) was used to measure serum levels of IL-27. Executed according to manufacturer.

Statistical Methods & Data Analyses

The following statistical analysis approaches by using social sciences (SPSS) version 23 in order to analyzed and assess the data of the study, (t) test and LSD was applied to find out the significant difference between the data. Differences were recorded as significant whenever the probability (P) was less than 0.05.

Results

A-IL-27 Concentration Level

A highest of serum concentration IL-27was recorded in miscarriages women with toxoplasmosis (31.531±33.03) when compared with control groups (14.430±3.095), there was significant difference (p<0.005) between serum level of IL-27 in both positive cases and control groups Table (1).

Table1 revealed that significant difference of IL-27 concentration in infected miscarriages women and non-infected pregnant women

Cytokine type Clinical group	Mean concentration ±SD IL-27 No.(Conc. Pg/ml)	t. Test value	df	P- value
Miscarriages women with toxoplasmosis	31.531±33.03	2.303*	94	0.03
Control	14.430±3.095	*Independent t-test between patient group & control group P<0.05.		

B-IL-27 Serum Concentration According to Age Groups

The high significant (P<0.05) increase in serum IL-27 concentration in miscarriages women with age 20-24 years was

38.369±42.151and the low level in miscarriages women with age ≥40 years was 20.108±5.113. It was found that there were statistical differences (P<0.05) of serum concentration of IL-27 in the cases of age groups Table (2).

Table 2: shows that mean concentration of IL-27± SD according to age groups

Clinical groups	Mean concentration ±SD IL-27 No.(Conc. Pg/ml)	
	Miscarriages women With toxoplasmosis	Control
Age group(year)	20-24	38.369±42.151
	25-29	30.974±37.641
	30-34	26.562±7.487
	35-39	27.716±6.720
	≥40	20.108±5.113
	Mean	31.531±33.034
*Levene test=12.123 P -value=0.001		ANOVA test=0.471
		ANOVA test =0.805

C-IL-27 Serum Concentration According to Residence

The highest concentration appear in in miscarriages women in rural area was

34.081±38.730. It was found that there were statistical differences ($P < 0.05$) of serum concentration of IL-27 according to residency. Table (3)

Table 3: Revealed that mean concentration of IL-27± SD according to residence.

Clinical groups		Mean concentration ±SD IL-27 No.(Conc. Pg/ml)	
		Miscarriages women with toxoplasmosis	Control
Residency	Urban	25.271±7.329	13.466±2.669
	Rural	34.081±38.730	15.395±3.321
	Mean	31.531±33.034	14.430±3.095
*Levene test=35.654 P- value=0.003		ANOVA test =1.113	ANOVA test =2.050

D-IL-27 Serum Concentration According to Occupation

The high concentration appear in housewife was 25.957±35.773.

It was found that there were statistical differences ($P > 0.05$) of serum concentration of IL-27 according to occupation Table (4).

Table 4: Shows that mean concentration of IL27± SD according to occupation

Clinical groups		Mean concentration ±SD IL-27 No.(Conc. Pg/ml)	
		Miscarriages women with toxoplasmosis	Control
Occupation	Housewife	25.957±35.773	13.932±2.654
	Official	59.251±40.753	17.169±3.985
	Student	25.574±7.319	13.983±3.402
	Mean	31.531±33.034	14.430±3.095
*Levene test=16.046 P- value=0.01		ANOVA test =6.030	ANOVA test =6.303

E-IL-27 Serum Concentration According to Miscarriages

The concentration of IL-27 in miscarriages women with one and two miscarriages was

(139.825±79.608), (118.454±29.934) respectively. It was found that there were statistical differences (P -value=0.002) of concentration IL-27 accordingly number of miscarriages. Table (5).

Table 5: shows that mean concentration of IL-27± SD according to numbers of miscarriages

Clinical groups		Mean concentration ±SD IL-27 No.(Conc. Pg/ml)	
		Miscarriages women with toxoplasmosis	Control
Numbers Of miscarriages	1	27.283±38.118	13.864±2.495
	2	46.035±39.052	15.652±3.823
	3	26.614±7.569	14.132±0.451
	≥4	22.596±5.206	13.760±6.763
	Mean	31.531±33.034	14.430±3.095
*Levene test=13.414 P- value=0.02		ANOVA test=5.615	ANOVA test=1.683

Discussion

It was obvious from the present study that there was a significant increase in serum level of IL-27 in miscarriages women with *T.gondii* by ELISA test in comparison with control group's level. The current result reveals that the concentration of IL-27 was elevated according to study groups.

These findings matching to other reported result that referred to increase of IL-27 serum level index at the beginning of mechanical defenses caused by some parasitic infection [10]. It was nearly identical to result that found high in the concentration of IL-27 resulting from the disintegration of tissue [11].

IL-27 have a role in reducing the mechanism of parasitic invasion through the placenta [12]. The present study finding was discordant with the research that concluded IL-27 have an inhibitory effect on the induction immune response resulting from parasitic and bacterial infections [13]. The present study found that there were statistical differences in serum concentration of IL-27 in case of age groups; it was observed high concentration of IL-27 in infected miscarriages women in age groups (20-24) years and (25-29). The result was incompatible with other interpretation that proved the evidence regarding the age-related differences in circulating IL-27 levels [14]. It was contravention with that founding by [15]. The result in the current study was compatible with that reported by [16].

Justification for this inverse relationship between age and decrease in the concentration of IL-27 related to the immune state and the young age appear more resistive for disease infection [17]. The present study results demonstrated that there was increased in concentration of IL-27 levels in miscarriages housewife women with significant differences with other study groups. It was the present study was nearly similar to the result that mentioned by [18].

The current study showed a variation in IL-27 concentration levels among individuals of residence in which the concentration was high in miscarriages rural toxoplasmic women and low in miscarriages urban toxoplasmic women. This result was not agree with others who recorded elevation in serum concentration in rural area more than the urban [19], While agree with other [20]. This may be attributed to variable levels of exposure of environmental pollution factor, which affect directly on physical activities and basal metabolism, and these factors deal with the impact infection with toxoplasmosis and these variations may contribute to differential disease susceptibility and level of

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stress tolerance. The results show statistical differences of concentration IL-27 in one and two miscarriages and this come no agree with that recorded by [21]. Moreover, it was nearly similar to result found by [22]. While compatible with [23] and agree with who fined statistical differences between IL-27 and numbers of miscarriages [24]. Explanation of variance in concentration of IL-27 according to miscarriages women with toxoplasmosis may be due to the occurrence of many problems in women's health including endometriosis.

Conclusion

From the results of this study, it is concluded that:

- IL-27 play a significant role in immunity against infection with *Toxoplasma gondii*.
- There is an association between elevated concentration of IL-27 levels in miscarriages women with toxoplasmosis.
- IL-27 concentration is elevated at young age's groups.
- IL-27 concentration is elevated at one and two number of miscarriages women groups.

Recommendation

The following points are recommended:

- Further experimental studies are recommended to know the concentration of IL-27 among miscarriages women to be one of an important laboratory test in the induction of immune response against this type of infection.
- Study the relationship between IL-27 with other pathogens or systemic disease that are causing miscarriage.
- Study the relationship between IL-27 with other cytokines play important role in immune response against parasitic or bacterial infection that are causing miscarriage.

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