

Study of Biochemical Aspects in Women Infected with *Trichomonas vaginalis* in Babylon Province

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Abstract: The current study was conducted through the period from October 2014 to April 2015, Studies were conducted to determine the effect of *Trichomonas vaginalis* in some biochemical indicators such as AST, ALT, ALP, Urea & C.R.P in women infected with *T. vaginalis* in Babylon province. The results of statistical analysis showed that there are significant differences were evident in the four biochemical tests AST, ALT, ALP, Urea for women infected with *T.vaginalis* compared to control, while no significant differences in C-reactive protein of infected women compared to non-infected women.

Keywords: T.vaginalis, AST, ALT, ALP, Urea

1. Introduction

There are many kinds of parasites transmitted through sexual contact and therefore cause Sexually Transmitted Diseases (STD) which have a significant impact on the dynamics of infected persons (Ryder *et al.*, 2007). The most important of these parasites is *Trichomonas vaginalis*, which intrudes on women's vagina and urethra and prostate gland for men. This parasite is considered one of the most common parasitic diseases in Europe and the United States which is one of the non-viral disease is sexually transmitted and which is estimated incidence in the world 248 cases a year (Secor *et al.*, 2014). Where it was diagnosed in many countries in the world including in Nigeria (Onyido *et al.* 2014), Sweden (Pellrud *et al.*, 2015), Sudan (Dahabet *et al.* 2012), India (Deivam *et al.*, 2014) and other.

There are a many diseases that cause a change in biochemical indicators, including malignancy, genetic defects, malnutrition, parasitic infections etc. (Chandra & Chandra, 2013). There are some research and biochemical studies that dealt with other parasites and their effects in some liver function, including the study conducted by the Al-Jowari & Hussein (2014) who has studied the relationship between toxoplasmosis and some biochemical indicators in the women infected with *Toxoplasma gondii*. Also Singh *et al.* (2015) who has studied the relationship between the Infection of malaria parasite and the rate of AST, ALT enzymes.

There are a many studies on several aspects concerning the incidence of this parasite, but we did not find any study on the relationship between the incidence of this parasite and its effects in biochemical tests for females infected with this parasite, so we believe this is the first study concerning this aspect, the aim of the current study is a measure of the level of some biochemical indicators such as AST, ALT, ALP, Urea & C.R.P in women infected with *T. vaginalis*.

2. Materials and Methods

It was selected blood samples from 30 women infected with *T. vaginalis* and 30 other blood samples from non-infected women (control), therefore from October 2014 to April 2015 in Babylon hospitals and private laboratories in

Babylon province. Some information was taken from patients such as name, age, address. Where some biochemical measurement standards for women with *T. vaginalis*, as well as women from the control group for the purpose of comparison, which included measurement of some liver enzymes, the level of urea in the blood and C reactive protein.

• Determination of Aspartate aminotransferase activity

Method Principle:

Optimized, modified method according to International Federation of Clinical Chemistry (IFCC), without Pyridoxal Phosphate.

$L\text{-aspartate} + 2\text{-Oxoglutarate} \leftrightarrow \text{Oxalacetate} + L\text{-glutamate}$

$\text{Oxalacetate} + \text{NADH} + \text{H}^+ \leftrightarrow \text{Malate} + \text{NAD}^+$

The rate of absorbance changing at $\lambda = 340 \text{ nm}$ is directly proportional to aspartate aminotransferase activity.

• Determination of Alanine aminotransferase activity

Method Principle:

Optimized, modified method according to International Federation of Clinical Chemistry (IFCC), without Pyridoxal Phosphate.

$L\text{-alanine} + 2\text{-Oxoglutarate} \leftrightarrow \text{pyruvate} + L\text{-glutamate}$

$L\text{-glutamate} + \text{NADH} + \text{H}^+ \leftrightarrow \text{lactate} + \text{NAD}^+$

The rate of absorbance changing at $\lambda = 340 \text{ nm}$ is directly proportional to aspartate aminotransferase activity.

• Determination of Alkaline Phosphate activity

Method Principle :

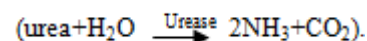
Kinetic method recommended by International Federation of Clinical Chemistry (IFCC).

$2\text{-amino-2-methyl-1-propanol} + \text{P-nitrophenylphosphat} + \text{H}_2\text{O} \rightarrow 4\text{-nitrophenol} + 2\text{-amino-2-methyl-1-propanol phosphate}$

The rate of 4-nitrophenol formation is directly proportional to the ALP activity.

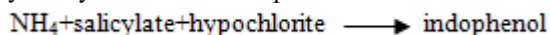
• Determination of serum Urea

Urea-kit enables end point enzymatic determination of urea concentrations (Urease – modified Berthelot reaction) in human urine, serum or plasma. Urease hydrolyzes urea by producing ammonium.



In an alkaline medium, the ammonium ions react with salicylate and hypochlorite to form a green colored

indophenols (2, 2dicarboxylindophenol). The reaction is catalyzed by the sodium nitroprusside :



The color intensity is proportional to urea concentration in the sample (Patton & Crouch, 1977).

• Detection of C-reactive protein (CRP)

It was follow the manufacturer's instructions for the kit of direct examination for the SPINREACT a company, for the detection of acute phase protein. It was followed qualitative way (Qualitative method) or examine slide Method and are summarized as follows: -

- 1) Allow the reagents and samples to reach room temperature. The sensitivity of the test may be reduced at low temperatures.
- 2) Place 50 µL of the sample (Note 1) and one drop of each Positive and Negative controls into separate circles on the slide test.
- 3) Mix the CRP-latex reagent vigorously or on a vortex mixer before using and add one drop (50 µL) next to the samples to be tested.
- 4) Mix the drops with a stirrer, spreading them over the entire surface of the circle. Use different stirrers for each sample.
- 5) Place the slide on a mechanical rotator at 80-100 r.p.m. for 2 minutes. False positive results could appear if the test is read later than two minutes.

Statistical analysis

The result has been counted by Qui – square under significance level ($p < 0.05$) to compare between infection rate (Al-Rawi, 1989).

Results and Discussion

There are many studies on several aspects specific to incidence of this parasite, but we did not find any study on the relationship between the incidence of this parasite and the levels of some biochemical tests, so we believe this is the first study concerning this aspect, Whether our results difficult to compare the results of other studies.

Results of statistical analysis showed that there are significant differences were evident in the four biochemical tests AST, ALT, ALP, Urea for women infected with *T.vaginalis* compared to control Where the P value for each of the four tests 0.001 below the level of Statistics 0.05 as in the table(1).

The results of the statistical analysis showed rise in the rate of AST enzyme in the infected women 33.83 compared to

control 19.83, below the level of Statistics 0.05 as in the table (1) and figure (1). Here are the current study may have agreed with Blann (2014) Which found that the infection with any pathogen microscopic organism causes an increase in the rate of AST, ALT, Considering this parasite is one of the microbiology pathogenic and rapid transition. As the result of the statistical analysis showed rise in the rate of ALT enzyme in the infected women 31.86 compared to control 16.56, below the level of Statistics 0.05 as in the table (1) and figure (2), and therefore the result current study may have agreed with (Blann, 2014), And converged with Al-Jowari & Hussein, (2014) Which found that there was a significant increase in the rate of the AST, ALT enzymes in women with *T.gondii* compared with the control group, and with Singh *et al.* (2015) which he found significant increase in the rate of ALT, AST in patients infected with the malaria parasite.

As for the alkaline phosphatase (ALP), the results showed a statistically significant higher in the rate of the enzyme in the infected women 110.6 for non-infected women 67.89, below the level of Statistics 0.05 as in the table (1) and figure (3), and therefore it agreed with both of (Uzuegbu & Emeka, 2011; Al-Jowari & Hussein, 2014; Singh *et al.*, 2015) Who found an increase in the ALP in patients with some of protozoa such as malaria and *T.gondii*. Results also showed an increase in blood urea level in the infected women 38.86 for non-infected women 25.77, below the level of Statistics 0.05 as in the table (1) and figure (4), and therefore it agreed with both of (Al-Jowari & Hussein, 2014; Singh *et al.*, 2015) Who found an increase in the urea level in patients with some of protozoa such as malaria and *T.gondii*.

The results indicated no significant differences in C-reactive protein of infected women compared to non-infected women, where the p value 0.078 below the level of Statistics 0.05 as in the table (2).

Table 1: Changes in Biochemical indicators in women with *Trichomonas vaginalis*

Test Name		Number	mean	Std. Error Mean	P value
AST	Patients	30	*33.83	2.69	
	Control	30	19.83	1.24	0.001
ALT	Patients	30	*31.86	2.47	0.001
	Control	30	16.56	1.07	
ALP	Patients	30	*110.6	11.53	0.001
	Control	30	67.89	3.43	
Urea	Patients	30	*38.86	2.5	0.001
	Control	30	25.77	1.06	

* significant deference

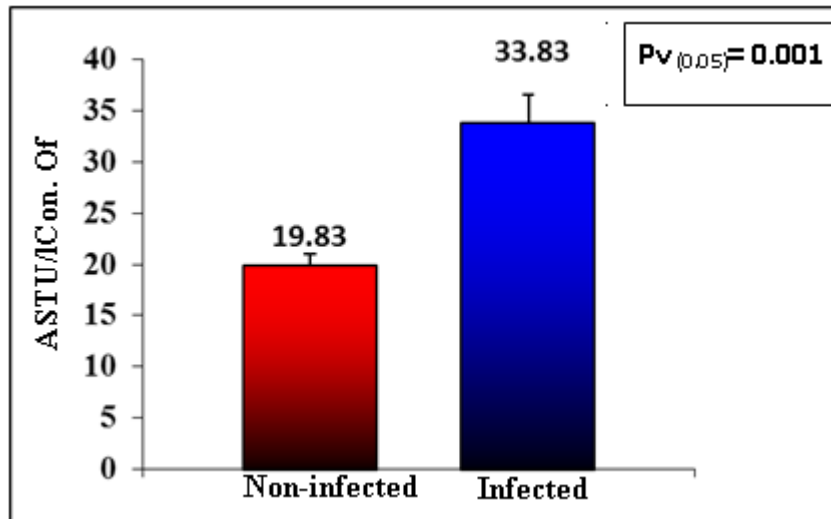


Figure 1: The difference in AST concentration rate among women infected and non-infected with *Trichomonas vaginalis*

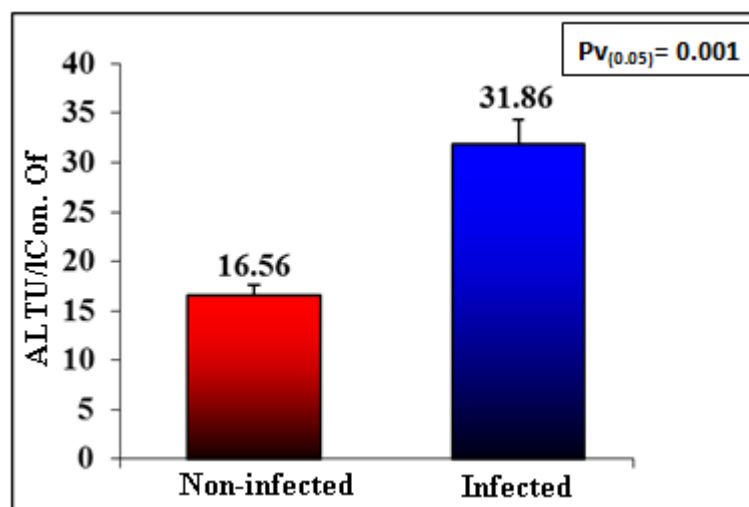


Figure 2: The difference in ALT concentration rate among women infected and non-infected with *Trichomonas vaginalis*

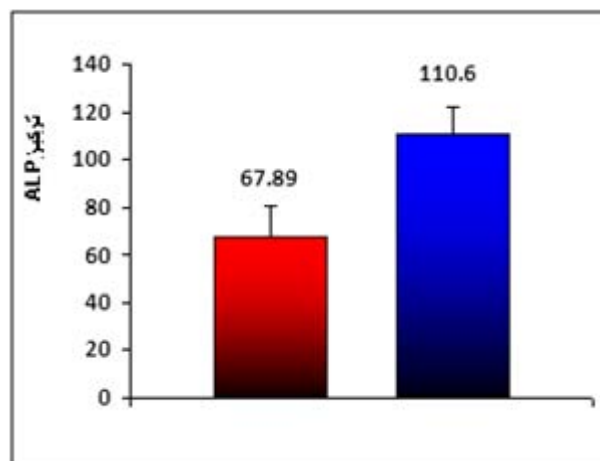


Figure 3: The difference in ALP concentration rate among women infected and non-infected with *Trichomonas vaginalis*

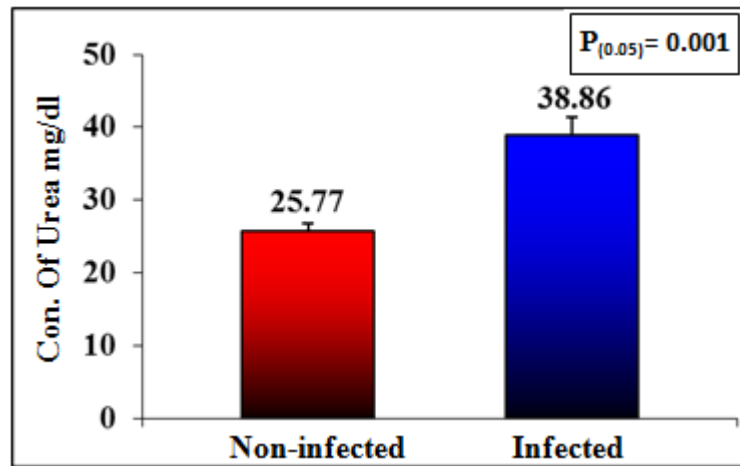


Figure 4: The difference in Urea concentration rate among women infected and non-infected with *Trichomonas vaginalis*

Table 2: The percentage change in the C-reactive protein concentration in women infected with *Trichomonas vaginalis*

C.R.P	Number	Mean	Std. Error Mean	P value
Infected	30	1.1	0.05	
Non-infected	30	1	0	0.078

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