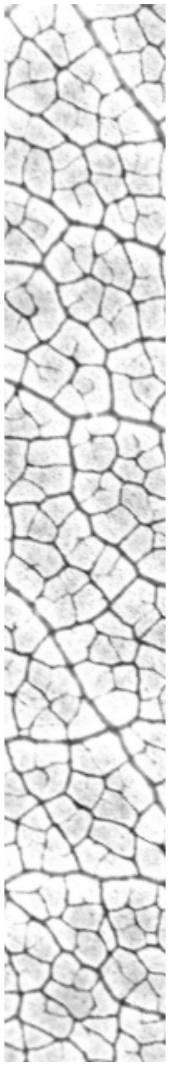

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Estimation of 5'-Nucleotidase from blood of women with Toxoplasma gondii parasites

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Abstract
5'-Nucleotidase (5'-NT) is a phosphatase enzyme that works on Nucleoside-5-monophosphate like adenosine-5-mono-phosphate , 5'-NT is a protein In vitro fertilization of the plasma membrane in a large variety of mammalian cells, is one of the most widespread enzymes in animals, plants, microorganisms, as well as some types of primates and parasites, it's found in many tissues of the human body, Serum , Thyroid, aortic artery, bone and human feces also exist in the kidney, vagina and red blood cells. This study aims to measure the activity of the 5'-NT enzyme from the women with toxoplasmosis. The study included (50) blood samples from healthy women and (50) patients they are between 18-45 years old. The results showed a significant increase in the activity of 5'-NT enzyme at a probability level of 0.01 in women with conical arcillary parasite compared to healthy and significantly higher in the activity of 5'-NT enzyme at the probability level of 0.01 in pregnant women with cones Non-pregnant women, also found increased activity of 5'-NT with age in sick women. There was also a significant increase in the activity of 5'-NT in non-pregnant women compared with healthy non-pregnant women with a probability of 0.01, and increased activity of 5'-NT during the last months of pregnancy in women and healthy compared to the first three months of pregnancy.

Keywords: 5'-Nucleotidase, blood, toxoplasma gondii parasites, enzyme

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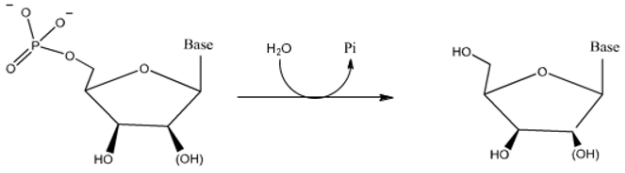
INTRODUCTION

The enzyme nucleotidase (5'-Nucleotidase) is a derivative of the nucleotide metabolism, which extracts phosphate from the deoxyribose monophosphate and ribonucleoside monophosphate, it's removal of the inorganic phosphate (Pi) captured with carbon atom No. 5 for the ribose or deoxyribonucleic acid of the nucleoside molecules as in the equation below (Zimmermann 1992):



AMP Adenosine

5'-NT works on the analysis of adenosine monophosphate (5'AMP) to adenosine and free phosphate, as adenosine is involved in many biological processes, such as expansion or narrowing of vessels (Newby et al. 1975). As well as in the process of immune suppression and cell proliferation (Arch and Newsholme 1978, Pull and McIlwain 1972). Furthermore, 5'-NT enzyme plays a role in the microfilaments system (Carson and Seegmiller 1976, Fischer et al. 1976). 5'-NT is an important point in regulating intracellular nucleotide aggregations to maintain DNA and RNA synthesis (Zachowski et al. 1981). 5'-NT have seven types analogues that are similar in their work to the base material but vary by the nature of the multiple peptide chains and the amino acids. The activity of these enzymes depends entirely on Mg + 2and is inhibited by inorganic phosphate (Pi), these enzymes have the same enzymatic properties and the same specificity of the substrate but differ in their chemical, physical and immunological properties (Hunsucker et al. 2005, Walldén 2008).

5'-NT used a biologic marker in liver disorders, and its increased catalytic activity is usually accompanied by hyperphosphatasaemia the liver's specificity towards 5'-NT enzyme enables it to use it to distinguish between the different causative factors of the condition, which may be these factors are either liver, bone, placenta, or intestines. 5'-NT concentration in the blood is often used to test liver function in individuals who have signs of liver problems (Greco 2016), and its activity in blood, red blood cells, eggs, diagnostic significance in some liver,

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Table 1. Modified ± Standard Ceviation of 5`-NT activity in blood of women with parasite compared with healthy

State	No.	Activity 5'-NT IU/L (Mean ± SD)	P value
Control	50	36.0 ± 17.0	0.01
Patient	50	123.3 ± 39.1	

Table 2. Average ± Standard Deviation of 5'-NT activity in the blood of pregnant women with parasites compared to healthy

State		No.	Activity 5'-NT IU/L (Mean ± SD)	P value
Control	PRG	22	35.2 ± 10.5	0.01
Patient	PRG	21	160.1 ± 18.4	

bloody, immunological and tumor disorders (Kavatcu and Melzig 1999).

So, due to the lack of in-depth studies to measure the effectiveness of the enzymes of the infected blood of this parasite, so the study included measuring the activity of the enzyme in 5'-NT blood infected with parasite Toxoplasma gondii.

METHOD

During the study, 50 blood samples were collected from women infected with parasite after infection, in addition 50 blood samples were collected from healthy women aged between (18-45) years.

Estimate the Activity of 5'-NT in the Blood

The Fisk and Subbarow method was used to estimate the activity of 5'-NT. The principle of this method is estimate to the number of inorganic phosphate micromolates obtained by reducing the base material 5'-AMP in the middle of the reaction using the detector Fisk and Subbarow (1925).

Statistical Analysis

The statistical analysis of the results of the research was based on the student's test t of the student's T test-2tails to determine the significant differences between the mean values using the ANOVA method.

RESULTS AND DISCUSSION

Table 1 shows the activity rate of 5'-NT in the blood of infected women and healthy, and when compared statistically, there was a significant increase in the activity of 5'-NT in blood of infected women compared to healthy at a probability level of 0.01.

Table 3. Average ± standard deviation in blood of non-pregnant women with parasites compared to healthy

State		No.	Activity 5'-NT IU/L (Mean ± SD)	P value
Control	NPRG	28	36.6 ± 20.9	0.0003
Patient	NPRG	29	96.6 ± 26.1	

The results are consistent with the findings of Al-Jassim (2013) and Al-Tai (2015) in the blood of gout and diabetic patients respectively, and our results do not agree with AL-Salhi (2008) and Jubouri (2018), there was a significant decrease in the activity of 5'-NT in the blood of people with anemia, diabetics and diabetic patients, respectively.

There was a significant increase in the activity of 5'-NT in the blood of pregnant women compared to healthy pregnant women and a potential level of 0.01, as shown in **Fig. 1**.

The results were consistent with those of Al-Attar (2007), there was an increase in the activity of 5'-NT in the blood of pregnant women with bone disease compared to healthy, while another study found an increase in the activity of 5'-NT in pregnant women when performing liver function tests for pregnant and non-pregnant women.

The results also showed a significant increase in the activity of 5'-NT in blood of parasite and age groups under study at a probability level of 0.01 compared to healthy in same age groups, as shown in **Fig. 1**.

The results of the study were consistent with Al-Attar (2007) and Al-Jassim (2013), there was a significant increase in the activity of 5'-NT and for the age group (20-40) years in blood of pregnant women with certain bone diseases and gout patients. The increase in activity of 5'-NT may be due to immunity and non-resistance to diseases during pregnancy and with age (Keijiro et al. 1985), this increase in the activity of 5'-NT with age increases the metabolic metabolism of nucleic acids. It has been observed that 5'- NT plays a role in reducing the energy charge with age by metabolizing ATP within the cell to adenosine via AMP and thus entering the physiological effects of aging (AL-Chalabi 1991).

Table 3 shows a significant increase in activity of 5'-NT in non- pregnant women compared with healthy non-pregnant women with a probability of 0.01.

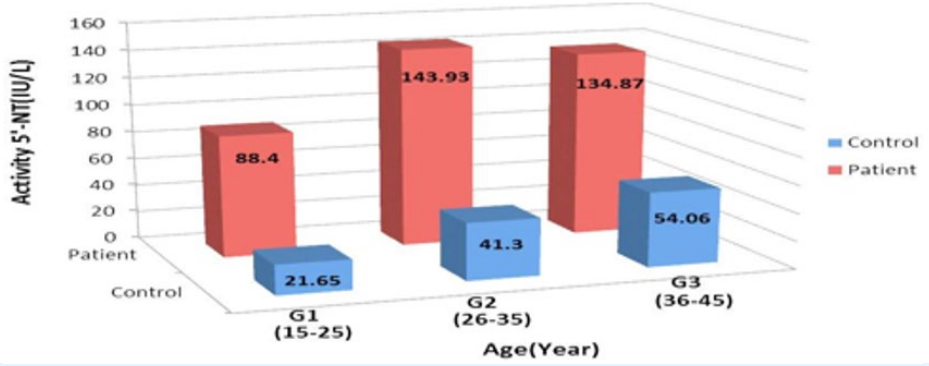

Fig. 1. Activity of 5'-NT in the blood of women with parasite and compared to healthy in age groups

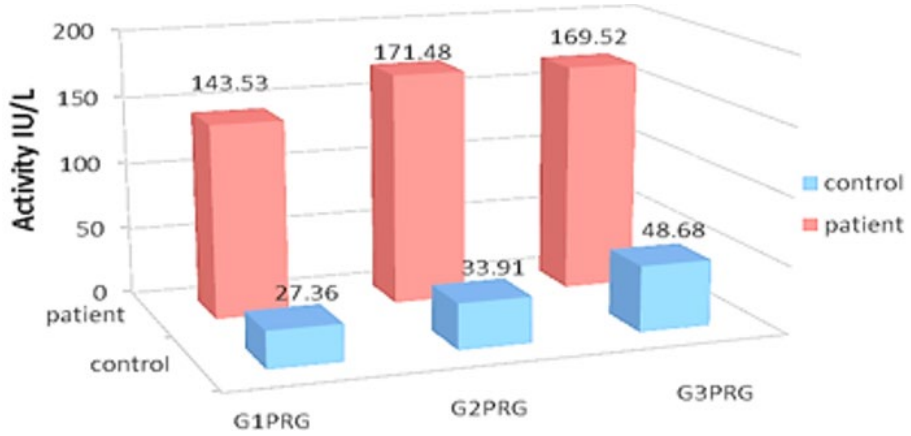

Fig. 2. Activity of 5'-NT in blood of pregnant women infected during pregnancy months compared to healthy

These results are consistent with the study of Pulak (2017), which indicated a significant increase in activity of 5'-NT in patients with viral hepatitis, liver disease and cirrhosis patients compared to healthy.

The results showed increased activity of 5'-NT during the last months of pregnancy in women and men compared to the first three months of pregnancy and at a probability level of 0.01, as shown in **Fig. 2**.

These results are consistent with Al-Attar (2007). This may be due to the weakness of immunity during pregnancy (Edwards and Bouchill 1999, Mardani et al. 2014, Öztuzcu et al. 2016, Solanki et al. 2018). Since 5'-NT has a specialized and important function, stress as it happens in pregnancy (Zimmermann 1992).

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