

# Study the Role of Congenital Toxoplasmosis with Preterm Labor, and Low Birth Weight

Asmaa M S Al-Bayati

Department of Medical Lab. Techniques, Northern Technical university, College of Health and Medical Techniques, Mosul, IRAQ.

Corresponding Author: asmaa.albayati@ntu.edu.iq



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## ABSTRACT

The study included 100 samples of blood from women who suffer from premature birth and low fetal weight, and a hundred samples from women who do not suffer from any injury. This study extends from February 1, 2019 to November 1, 2019, where the study included collecting blood samples from all women who entered the study, in addition to collecting information regarding age, weight, height, and history of infection with parasites, if any, to investigate the parasite's DNA in blood samples collected from patients. These samples were examined using the standard methods provided by the company in which the tests were conducted. The study included the molecular detection by PCR of toxoplasma genes, where EDTA blood samples were collected from all preterm and term pregnant women in the study. Using laboratory kit for Toxoplasma DNA extraction, samples were extracted and kept in separate sterile tubes using DAN extraction kit (Zymogene, Japan), then the DNA was detected by real-time PCR which was done according to the protocols designed by the manufacturer of the diagnostic kit. The study showed no significant relationship between the two groups regarding mean of ages. But regular contractions, reduced length of cervix and decreased weight of babies was highly related with women presented with preterm birth. The study showed that 87.5% of preterm delivery women with +ve DNA detection of *T. gondii* have regular contraction comparing with 12.5% of cases with negative *T. gondii* infection ( $P < 0.001$ ). The study showed the lowest mean of baby weight at birth was recorded in pregnant women with preterm labor women who infected with *T. gondii* as compared with cases who were negative to *T. gondii* infection ( $P < 0.001$ ). The study demonstrated that majority of women with +ve *T. gondii* infection were had positive history of abortion.

**Keywords-** congenital toxoplasmosis, preterm labor, low birth weight, Kirkuk.

## I. INTRODUCTION

*Toxoplasma gondii*, is an obligate intracellular protozoan parasite that causes one of the most widespread zoonoses diseases, Toxoplasmosis. From a medical perspective, *T. gondii* infection is crucial, particularly for pregnant women, newborns with congenital infections, and those with impaired immune systems<sup>(1)</sup>.

Congenital toxoplasmosis, from use near pregnancy with fetal-formed and incidence of 0.6-14.3/1000 it is an intrauterine choice<sup>(2)</sup>. serologically in the newborn mild form was detected, chorioretinitis, hydrocephalus and intracranial broad spectrum up to

severe form showing calcifications seen in. Passing the infection to the baby is a risky pregnancy. Early low, buy and sequelae it is more serious<sup>(3,4)</sup>. Infection, parasite, DNA surfaces against the surfaces of parts or interference on the basis of detection of antibodies. Toxoplasma specific antibodies against gondii surface antigens It is widely used serologically. Two different serum tests taken at least three weeks apart in pregnant women fold and above antibodies in certain toxoplasma antibodies is the acquaintance of the memory<sup>(5)</sup>. In the first two trimesters only A positive IgG antibody indicates the condition and onset does not pose a risk to the fetus. done in the third trimester In the examination, in pregnant women who were found to be IgG positive

and IgM negative, initial plans, but this is due to the fact that pregnancy closed the disease in the head. In this situation, the toxoplasma avidity test may be helpful. Toxoplasma IgM and If IgA is positive, it shows the distinctive feature; in this situation fetus should be investigated <sup>(5)</sup>. Fetal IgM antibodies from birth may not be detected before or if the newborn has Toxoplasma from birth as it may be delayed after *T. gondii* Recognizing serological congenital preparations running is power <sup>(6)</sup>. Long-term preserves “primertoprim, sulfadiazine, folinic acid preparation therapy” and some prednisone treatments <sup>(7,8)</sup>. The aim of the Study was to evaluate the role of congenital toxoplasmosis in preterm labor and low birth weight.

## II. MATERIALS AND METHODS

The study included 100 samples of blood from women who suffer from premature birth and low fetal weight, and a hundred samples from women who do not suffer from any injury. This study extends from February 1, 2019 to November 1, 2019, where the study included collecting blood samples from all women who entered into the study, in addition to collecting information

regarding age, weight, height, and history of infection with parasites, if any, to investigate the parasite’s DNA in blood samples collected from patients. These samples were examined using the standard methods provided by the company in which the tests were conducted. The study included the molecular detection by PCR of toxoplasma genes, where EDTA blood samples were collected from all preterm and term pregnant women in the study. Using laboratory kit for for Toxoplasma DNA extraction, samples were extracted and kept in separate sterile tubes using DAN extraction kit (Zymogene, Japan), then the DNA was detected by real-time PCR (Sacece biotechnology, Italy) which was done according to the protocols designed by the manufacturer of the diagnostic kit.

## III. RESULTS

The study showed no significant relationship between the two groups regarding the mean of age. But regular contractions, reduced length of the cervix, and decreased weight of babies were highly related to women presented with preterm birth (Table 1).

**Table 1: Demographic properties of studied women**

Variables	Preterm Labor (n:100)	Control group (n:100)	P. value
Age	33.5±3.9	32.5±3.8	0.71
contractions regularity	38 to 100	0 to 100	0.015
length of cervix (mm, median (minmax))	21 (5 - 47)	37 (26 - 52)	0.012
weight of baby (gm) (mean (range))	2659 (1862-3200)	3381 (3180-3535)	0.003

In this study, 40% of studied cases with preterm labor were infected with Toxoplasma

compared with 10% of the control group (P<0.01), Table 2.

**Table 2: Frequency of Toxoplasma DNA positive tests in pregnant women with and without preterm labor**

Toxoplasma by PCR	Preterm		Control group	
	No.	%	No.	%
Positive	40	40	10	10
Negative	60	60	90	40
Total	100	100	100	100
<i>P. value = 0.001</i>				

The study showed that 87.5% of preterm labor women who infected with *T. gondii* were predicted to

have regular contraction as compared 12.5% of cases with negative *T. gondii* infection (P<0.001), Table 3.

**Table 3: Relation of toxoplasma infection with prediction of regular contraction**

Toxoplasma by PCR	No.	Regular contractions			
		Present		Absent	
		No.	%	No.	%
Positive	40	35	87.5%	5	8.33
Negative	60	5	12.5	55	91.67
Total	100	40	100	60	100

*P<0.001*

The study showed the lowest mean of baby weight at birth was recorded in pregnant women with preterm labor women who infected with *T. gondii* as

compared with cases who were negative to *T. gondii* infection ( $P < 0.001$ ), Table 4.

**Table 4: Relation of toxoplasma infection with birth weight**

Toxoplasma PCR	No.	Birth weight (gm)	
		Mean	SD
Positive	40	2345	234
Negative	60	2765	247

$P < 0.001$

The study demonstrated that majority of women with +ve *T. gondii* infection were had positive history of

abortion, Table 5.

**Table 5: *T. gondii* and history of abortion**

History of abortion	No. of examined samples	No of <i>T. gondii</i> +ve	Percentage
Yes	33	28	84.85%
No	67	12	17.91%

#### IV. DISCUSSION

The showed that 40% of studied cases with preterm labor were infected with *Toxoplasma* compared with 10% of the control group ( $P < 0.01$ ). Wujcicka *et al* <sup>(2)</sup> demonstrated no relationship between the two groups regarding the mean of their ages. The association between *Toxoplasma* infection and preterm labor has been well documented <sup>(4,7)</sup>. Robbins *et al* <sup>(9)</sup> studied 30 specimens from with preterm labor, 29 of which were positive by *T. gondii* encoding region in situ hybridization, and 13 were positive by RT-PCR. Another study found that 16 of 24 samples of preterm women were positive by RT-PCR for *T. gondii* <sup>(10)</sup>. Previous studies demonstrated a strong association between *Toxoplasma* infection with preterm labor <sup>(3,5)</sup>. Multiple etiological factors are believed to be involved in preterm delivery development, including genetic susceptibility, *T. gondii* infection, and hormones <sup>(2,11)</sup>. Women infected with toxoplasmosis suffer from premature birth, as revealed by advanced tests that detect parasite DNA, which proved that there is a strong positive relationship between the risk of premature birth and the high level of DNA of the parasite in persons with premature birth and low weight. <sup>(12, 16)</sup>. Others shows similar results to our study, after testing the sera of 130 abortive and 130 non-abortive women by ELISA statistical difference was detected between toxoplasma infection and abortion <sup>(13)</sup>. Consistent with our results, Dunn *et al* <sup>(14)</sup> and Pual *et al* <sup>(15)</sup> reported in a previous study that women infected with the parasite were characterized by the presence of birth defects in their fetuses, while they also found that pregnant women who were infected gave birth to low birth weight babies due to infection with the parasite. Freeman *et al* <sup>(17)</sup>. It showed that women infected with toxoplasmosis are more likely to have a deteriorating health condition, especially those women who suffer

from severe infection with this parasite, which eventually leads to premature birth or the birth of children with low weight and who suffer from problems after birth and most of preterm labor women who infected with *T. gondii* were predicted to have regular contraction compared with control women

#### V. CONCLUSIONS

It can be concluded that, 40% of studied cases with preterm labor were infected with *Toxoplasma* compared with 10% of the control group

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