

## Case Report

# Co-infection of *Toxoplasma gondii* and HIV Infections in Pregnancy in Bamako - A Case Report

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## To cite this article:

Mazo Koné, Henrietta Oluwatoyin Awobode. Co-infection of *Toxoplasma gondii* and HIV Infections in Pregnancy in Bamako - A Case Report. *International Journal of Infectious Diseases and Therapy*. Vol. 5, No. 1, 2020, pp. 1-3. doi: 10.11648/j.ijidt.20200501.11

Received: January 13, 2020; Accepted: January 27, 2020; Published: February 12, 2020

**Abstract:** *Background:* *Toxoplasma gondii* infections cause serious complications in HIV-infected pregnant women, leading to miscarriages, stillbirths, birth defects such as mental retardation, blindness, epilepsy, and could favour or enhance the mother-to-child transmission of HIV. Worldwide, 30% of the population have antibodies to the intracellular protozoan parasite *Toxoplasma gondii* and about 36.7 million people are infected with HIV, however little is known about the prevalence of co-infection of *Toxoplasma gondii* and HIV in pregnancy. We report co-infection of *Toxoplasma gondii* and HIV in pregnant women in Mali. *Methods:* *Toxoplasma gondii* anti- IgG, IgM and HIV Combi PT serology were performed in sera from pregnant women using the Elecsys system. The HIV genotyping was performed using the Tri-DOT technique. *Results:* One pregnant woman out of 247 screened was anti-*Toxoplasma* IgM positive and HIV type I positive. An anti-*Toxoplasma gondii* IgM positive reading is an indication of an acute/current infection. *Conclusion:* This suggests there is active toxoplasmosis transmission and therefore a possible risk for congenital infections in Bamako. HIV infection being endemic in Mali may accentuate toxoplasmosis pathology in this region. Toxoplasmosis surveillance and awareness are therefore necessary in Bamako to stem the scourge of this neglected infection.

**Keywords:** *Toxoplasma gondii*, HIV, Pregnant Women, IgM Serology

## 1. Introduction

*Toxoplasma gondii* (T. gondii) is an obligate intracellular protozoan parasite that can infect nearly all warm-blooded animals including humans, and causes serious and life-threatening disease in developing fetuses and immune-compromised people [1, 2]. T. gondii and Human immunodeficiency virus (HIV) co-infection is known to be fatal and devastating [3]. An active HIV infection is known to weaken the immune system opening the door for opportunistic infections to affect the body [4]. Toxoplasmosis is one of these opportunistic infections known to be the most common central nervous system infection in patients with the Acquired Immunodeficiency Syndrome (AIDS) almost all over the world [5], the infection is also as known to be teratogenic [6].

Pregnancy is an extraordinary period, with intense

physiological and psychological alterations, where almost every system in the body is structurally or functionally altered [7]. During pregnancy, the immune system is more tolerable, which makes individuals more susceptible to infections [7]. One of the leading causes of perinatal mortality is congenital infection [8]. Women are more susceptible to these teratogenic infections during gestation, a period when these infections can cause damages [9] to the foetus when not diagnosed and treated early.

Worldwide, 30% of the population are living with antibodies to the intracellular protozoan parasite *Toxoplasma gondii* and about 36.7 million people are infected with HIV [9, 10]. The overall prevalence of Acute *Toxoplasma* Infection (ATI) in pregnant women globally is 1.1% [12]. Untreated ATI during pregnancy can cause severe adverse outcomes for the fetus and new-born [12]. While HIV weakens the immune system, the co-infection of HIV and T. gondii could be fatal

especially in pregnancy for both the foetus and the mother [4]. However, little is known about the prevalence of co-infection of acute *Toxoplasma* infection and HIV in pregnancy in West Africa and especially at Bamako in Mali. In this paper, we reported a co-infection of *T. gondii* and HIV infection in a pregnant Malian woman.

## 2. Materials and Methods

### 2.1 Anti-Toxoplasma Test

Plasma separated from the blood collected from 247 pregnant women into Ethylenediaminetetraacetic acid (EDTA) bottles was used for the assays after 15 minutes of rotation on a centrifuge. The anti-Toxoplasma Immunoglobulin Gamma (IgG) and Immunoglobulin Macro (IgM) tests were performed using the Elecsys an Enzyme-Immunoassays technique on plasma for the detection of anti-*T. gondii* IgG and IgM antibodies. The Elecsys anti-Toxoplasma IgG and IgM tests (Roche Diagnostics, Rotkreuz, Switzerland) are fully automated Enzyme Immuno Assays using Chemiluminescence for the measurement of anti-Toxoplasma IgG and IgM antibodies [9–11]. The cut-off of ToxoIgM was set at 1.0 Arbitrary Unit/mL (AU/mL); results  $>0.8$ – $0.99$  AU/mL are considered indeterminate while results  $=1$  AU/mL and above are positive. The cut-off of ToxoIgG was 3 IU/mL results  $>1$ – $2.9$  IU/mL are considered indeterminate while results  $=3$  International Unit/ML (IU/mL) and above are positive [16].

### 2.2. HIV Test and Genotyping

The HIV Combi PT® is an Elecsys an Enzyme ImmunoAssays (EIA) technique on serum/plasma for in vitro qualitative determination of the p24 antigen of HIV1 and also antibodies to group O and HIV2 in human sera and plasma [17]. The HIV genotype was determined using the HIV Tri-Dot technique. The HIV Tri-Dot is a rapid test for the qualitative and differential detection of antibodies to HIV1 and HIV2 in Human serum/Plasma.

### 2.3. Blood Cells Check and Haematology

The cluster of differentiation 4 (CD4) rate was determined by BD FACSPresto™ count [18]. The Complete Blood Count (CBC) of the patient was also determined using Horiba ABX Prenta XL 80 a fully automated machine, with the blood collected into EDTA tubes.

### 2.4. Ethical Approval

Ethical and medical approval was obtained from the University of Ibadan/University College Hospital Ethics Committee and The Malian National Ethics Committee on Health and Life Science for the Protection of Human Subjects. Informed consent was obtained from the participants.

## 3. Results

Of the fourteen anti-Toxoplasma IgM positive one was

HIV type I positive (Table 1). The Patient was apparently healthy and strong, The Complete Blood Count (CBC) investigation showed a light anaemia (11.1g/dL of haemoglobin) with a normal White Blood Cell number ( $5.8 \times 10^3/\mu\text{L}$ ). The CD4 ( $750 \text{ cells}/\mu\text{L}$ ) of the patient was also found to be normal.

Table 1. *T. gondii* and HIV serology data for an infected woman.

	Toxoplasma		HIV	
	IgM AU/mL	IgG IU/mL	HIV1	HIV2
Case	1.750 Positive	0.13 Negative	Positive	Negative

\*AU : Arbitrary Unit, IU : International Unit.

## 4. Conclusion

The positive IgM suggests a current infection since IgM positivity is an indication of a newly acquired infection also known as Acute *Toxoplasma* Infection, this may explain the normal White Blood Count (WBC) and CD4 counts reported. This report suggests that there is a possible active Toxoplasmosis transmission and a high likelihood for congenital infection in pregnant women in Bamako where HIV infection is known to be endemic. Toxoplasmosis surveillance and awareness in Bamako is therefore necessary to control and prevent new infections of this neglected infection.

## Conflict of Interest

The authors declare that they have no conflict of interest.

## Funding

This study was made possible by grants from the ECOWAS through the ECOWAS Nnamdi Azikiwe Academic Mobility Scheme (ENAAMS) programme.

## Acknowledgements

The authors express profound gratitude to the women who participated in this study, for their kind cooperation. Appreciation also goes to the staff and head of the Pa&Ka medical laboratory for their assistance.

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