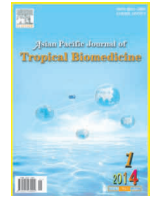




Contents lists available at ScienceDirect

## Asian Pacific Journal of Tropical Biomedicine

journal homepage: [www.elsevier.com/locate/apjtb](http://www.elsevier.com/locate/apjtb)

Document heading doi:10.1016/S2221-1691(14)60211-2 © 2014 by the Asian Pacific Journal of Tropical Biomedicine. All rights reserved.

## Toxoplasmosis among pregnant women: High seroprevalence and risk factors in Kinshasa, Democratic Republic of Congo

Yobi Doudou<sup>1</sup>, Piarroux Renaud<sup>2</sup>, L'Ollivier Coralie<sup>2</sup>, Franck Jacqueline<sup>2</sup>, Situakibanza Hypolite<sup>1</sup>, Muhindo Hypolite<sup>1</sup>, Mitashi Patrick<sup>1</sup>, Inocêncio da Luz Raquel Andreia<sup>3\*</sup>, Van Sprundel Marc<sup>3</sup>, Boelaert Marleen<sup>4</sup>, Van Geertruyden Jean-Pierre<sup>3</sup>, Lutumba Pascal<sup>1,4,5</sup>

<sup>1</sup>Kinshasa University, Democratic Republic of Congo

<sup>2</sup>University Hospital of Timone, Marseille, France

<sup>3</sup>University of Antwerp, Antwerp, Belgium

<sup>4</sup>Institute of Tropical Medicine, Antwerp, Belgium

<sup>5</sup>Institut National de Recherche Biomédicale, Kinshasa, Democratic Republic of Congo

## PEER REVIEW

## Peer reviewer

Pr H Pelloux, Parasitology–Mycology, Teaching Hospital, Medicine Faculty and Joseph Fourier University, Grenoble, France.  
HPelloux@chu-grenoble.fr

## Comments

This is an interesting short paper that gives recent data concerning the *Toxoplasma* seroprevalence in pregnant women in Democratic Republic of Congo. The population studied was randomly selected and the results obtained can help to build local health policies in order to decrease the disease burden.

Details on Page 73

## ABSTRACT

**Objective:** To determine the seroprevalence of toxoplasmosis in pregnant women, as well as the proportion of acutely infected and risk factors in the Democratic Republic of Congo.

**Methods:** Thirty maternities in Kinshasa were randomly selected and women attending antenatal consultation were invited to participate. They were interviewed with a structured questionnaire about known risk factors (age, meat consumption, contact with soil, and presence of cat) and a venous blood sample was taken. Sera were analysed for total immunoglobulins (Ig) by VIDAS Toxo Competition using Enzyme Linked Fluorescent Assay. IgM was determined by VIDIA Toxo IgM and IgG avidity by VIDAS Toxo IgG avidity.

**Results:** A total of 781 women were included. Median age was 28 years old (IQR: 8.5). And 627 women (80.3%; 95% CI: 77.5–83.1) were found to be positive to total Ig and 17 out of 387 (4.4%; 95% CI: 2.3–6.4) were positive to IgM. IgG avidity was low for 2 (11.8%) women, intermediate for 2 (11.8%) and high for 13 women (76.4%). There was no statistically significant association between *Toxoplasma gondii* infection and any risk factors assessed.

**Conclusion:** In Kinshasa, toxoplasmosis endemicity is highly prevalent. One woman out of twenty five had a recent toxoplasmosis infection and 20% were not protected against primo-infection, indicating a need for measures to prevent and control toxoplasmosis during pregnancy.

## KEYWORDS

Seroprevalence, Toxoplasmosis, Pregnant women, Kinshasa

### 1. Introduction

Toxoplasmosis is a zoonosis with a cosmopolitan distribution and is caused by the intracellular protozoa *Toxoplasma gondii* (*T. gondii*), which infects a vast range of mammals including human beings. One third of the worldwide population is estimated to be at risk[1,2]. The

prevalence of infection in man varies depending on the alimentary habits, hygienic conditions, the presence of the definitive host (cat) and the climate[3–5]. It varies among different countries and within the country from one province to another[6,7]. In Europe, the prevalence varies between 20%–50% in the South and between 50%–70% in the West, whereas in the humid region of Africa, the prevalence varies

\*Corresponding author: Dr. Inocêncio da Luz Raquel A., International Health Unit Faculty of Medicine, Universiteitsplein 1, 2610 Antwerp, Belgium.  
Tel: +32 3265 2874  
E-mail: [raquel.daluz@uantwerpen.be](mailto:raquel.daluz@uantwerpen.be)  
Foundation Project: Supported by the VLIR UOS Project (Grant N. VLIR/42/FA02000/13/5806), University of Antwerp and University of Kinshasa.

## Article history:

Received 15 Oct 2013

Received in revised form 21 Oct, 2nd revised form 3 Nov, 3rd revised form 12 Nov 2013

Accepted 23 Dec 2013

Available online 28 Jan 2014

between 50%–70%<sup>[8]</sup>. In Franceville, Gabon, a study in 2009 reported that 56% of the pregnant women were immunised and 2.5% had a recent toxoplasmosis infection<sup>[9]</sup>. The poor socio-economic level of third world countries in Latin America, Asia and Africa has been the primary risk factor as it has been associated to the high prevalence found in these countries<sup>[10–12]</sup>. In the Democratic Republic of the Congo (DRC), the latest data dates back to the 1970's and a proportion of 46% seropositive pregnant women was reported along with active infection found in 1% of the women at the University Clinic of Kinshasa<sup>[13]</sup>.

In the majority of the cases, toxoplasmosis is an asymptomatic disease, but it can have devastating consequences in immunocompromised patients and non-immunized pregnant women<sup>[1]</sup>. *T. gondii* is usually transmitted to man through ingestion of oocysts excreted by cats and potential sources of infection are mainly contaminated water, food or soil. Consumption of raw or undercooked meat containing living cysts can also cause an infection. Finally, congenital toxoplasmosis leads to parasite transmission to the fetus via the placenta when the mother has active infection during pregnancy<sup>[2,8,14]</sup>.

The risk of foetal transmission depends on the moment of infection during pregnancy, early diagnosis and treatment. Transmission to the fetus is less than 5% when maternal infection occurs before the 12th week of pregnancy, but it increases with gestation and the risk becomes higher than 80% in the final phase of the pregnancy. However, the severity of congenital toxoplasmosis decreases with gestation and varies between latent or asymptomatic infections to severe congenital malformations, such as neurological, ocular, multi-visceral disorders and spontaneous abortions<sup>[5,15,16]</sup>. In countries there were no surveillance strategies against congenital toxoplasmosis, and a large proportion of congenital malformations and/or spontaneous abortions could be explained by a toxoplasmosis infection during pregnancy<sup>[17–19]</sup>. In Kinshasa, 1767 cases of spontaneous abortions and 1435 cases of intra-uterine deaths were reported. Additionally, Handicap International reported 306 cases of children born with a handicap in 2011, from which certain cases could be due to congenital toxoplasmosis<sup>[20]</sup>.

Biological tests which detect toxoplasmosis infection mainly rely on detection of specific immunoglobulins (Ig) of the type IgM and IgG<sup>[5]</sup>. The presence of IgM is an indication that the host has recently been infected. Consequently, the IgG avidity test is used to estimate the time of seroconversion. If the avidity test is not conclusive, it is necessary to study antibody kinetics with a serological control 2–3 weeks later<sup>[21,22]</sup>.

The aim of this study was to perform an epidemiological study on toxoplasmosis infection in pregnant women living in Kinshasa. In addition, the principal risk factors were assessed. Due to the lack of published data in the last thirty years, this study provides crucial updated information on the

seroprevalence of pregnant women in Kinshasa, DRC.

## 2. Materials and methods

### 2.1. Study area

A cross sectional study was conducted to determine the seroprevalence and associated risk factors of toxoplasmosis in pregnant women in the province/city of Kinshasa during the period of May to June 2011. The city of Kinshasa is the capital of DRC. Its population is estimated at 10 million in habitants with a fertility rate of 5.2<sup>[23]</sup>. Each year, approximately 400 000 pregnancies are forecasted in Kinshasa.

Thirty sanitary structures were randomly chosen within the list of registered maternities in Kinshasa.

### 2.2. Study population

The participants were pregnant women attending prenatal care between the 2nd of May and the 30th June 2011. Each woman attending prenatal consultation that approved the informed consent was included in the study.

Sample size was calculated on the basis of an expected prevalence rate of 50% with an acceptable sample error of 5% and cluster effect of 2. The number of pregnant women per sanitary structure was adjusted according to the monthly average attendance to prenatal consultations.

### 2.3. Data and sample collection

After acquiring the informed consent of the participant, a structured questionnaire was used to investigate known risk factors (age, consumption of raw or undercooked meat, consumption of raw or unwashed vegetables, contact with soil, and presence of cat) and 5 mL of venous blood was collected without anticoagulant in an aseptic way. Serum was obtained after five minutes centrifugation at 3 000 r/min, conserved at –20 °C and transferred to the laboratory of parasitology at the university hospital “La Timone” at Marseille (France) for serological analysis.

### 2.4. Serological tests

Serological tests were performed using Enzyme Linked Fluorescent Assay (ELFA) with the VIDAS Toxo-competition kit (BioMérieux, France) which permitted the detection of total immunoglobulins against *T. gondii* (Total Ig)<sup>[22]</sup>. The samples with a positive ELFA were further analysed using the immuno-chimi-luminescence technique with the VIDIA Toxo-IgM (BioMérieux, France) to detect specific IgM. Subsequently, IgM positive samples were analysed using the IgG avidity test with the VIDAS IgG Avidity kit (BioMérieux) to determine the time of seroconversion. The IgG avidity test

Download English Version:

<https://daneshyari.com/en/article/2032870>

Download Persian Version:

<https://daneshyari.com/article/2032870>

[Daneshyari.com](https://daneshyari.com)