



Review Article

## Toxoplasmosis in Sudan: An Overview

Khalid Abdelsamea Mohamedahmed<sup>1,2,3\*</sup>, Eltaf Abbas Eltayeb<sup>3</sup>, Inas Tarig Omer<sup>3</sup>, Alweeya Mohammed Ahmed<sup>3</sup>, Abdelhakam G. Tamomh<sup>4</sup>, Albadawi Abdelbagi Talha<sup>3,5</sup>, Adam Dawoud Abakar<sup>3</sup>

<sup>1</sup>Department of Hematology, Faculty of Medical Laboratory Sciences, University of Gezira, Wad Medani, Sudan

<sup>2</sup>Department of Immunology, Faculty of Medical Laboratory Sciences, University of Gezira, Wad Medani, Sudan

<sup>3</sup>Department of Medical Parasitology, Faculty of Medical Laboratory Sciences, University of Gezira, Wad Medani, Sudan

<sup>4</sup>Department of Parasitology and Medical Entomology, Faculty of Medical Laboratory Sciences, University of Ellmam El Mahdi, Kosti, Sudan

<sup>5</sup>Department of Clinical Laboratory Sciences, Jouf University of Gezira, Al-Jawf, Saudi Arabia

### Abstract

*Toxoplasma gondii* (*T. gondii*) is one of the most serious blood coccidian parasite infections in veterinary and medical medicine, contributing to ill health and financial losses infecting about one-third of the world's population. It can produce life-threatening infections, despite the fact that most infections are asymptomatic. Several studies in Sudan reveal that the prevalence of toxoplasmosis was high especially among pregnant women resulting in Fetal death, premature birth, intrauterine growth retardation. involvement the attention to improvements in management and personal hygiene, raising awareness; control of cats, avoiding raw and undercooked meat should be done to reduce the prevalence and controlling Toxoplasmosis among the population.

**Keywords:** *Toxoplasma gondii*, Toxoplasmosis, Sudan

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### Introduction

Parasitic protozoan infection represents a severe health problem in underdeveloped countries and has been linked to a variety of illnesses and even death (1,2). The coccidian protozoa of the phylum Apicomplexa are among the most serious parasite infections in veterinary and medical medicine, contributing to ill health and financial losses (2). Coccidian parasites are members of the *Sporozoa* class and *Eimeriida* order that can be divided into *Toxoplasma*, *Cryptosporidium*, *Cyclospora*, and *Isospora* genera. *Cryptosporidium*, *Cyclospora*, and *Isospora* are intestinal coccidian parasites, while *Toxoplasma* is a tissue parasite (3).

About one-third of the world's population is infected with this obligate intracellular protozoan *Toxoplasma gondii*. It can produce life-threatening infections despite the fact that most infections are asymptomatic. In addition, it causes congenital and opportunistic infections such as HIV and the developing fetus in immunocompromised people (4).

Tissue coccidia is obtained through the eating of sporulated oocysts secreted with the cat's feces or consuming raw or undercooked meat from contaminated vertebrates (5). Felids (domestic and wild cats) play a key role in the parasite's epidemiology of *T. gondii* because they are the only hosts that are capable of excreting the

oocysts that are resistant to the environment (6).

The disease caused by *T. gondii* (toxoplasmosis) was also identified as one of the neglected tropical zoonotic diseases. Depending on the immunological response of the host, toxoplasmosis ranges from asymptomatic to fatal clinical forms in immunocompetent hosts (7). Lymphadenopathy is the most prevalent symptom of acute acquired toxoplasmosis. Moreover, fever, headaches, myalgia, and splenomegaly are all common symptoms. Although lymphadenopathy may continue, the sickness resembles moderate flu and is self-limited (8). Fetal death, premature birth, intrauterine growth retardation, fever, pneumonia, hepatosplenomegaly, and thrombocytopenia are all among the possible outcomes of congenital infection (9).

*Toxoplasma gondii* has typically been detected in feces, water, ambient, and tissue samples in animals or humans using a microscope. However, relying solely on light microscopy for diagnosis is insensitive and unreliable. Filtration or centrifugation can enrich oocysts in feces, water, and the environment from vast volumes of samples for testing (10). Some available serological diagnostics for detecting different antibody classes or antigens are enzyme-linked immunosorbent assays, modified agglutination test, immunosorbent agglutination assay, dye test, indirect fluorescent antibody test, indirect



\*Corresponding Author: Khalid Abdelsamea Mohamedahmed, Email: khalid.gu89@gmail.com

haemagglutination assays, and immunochromatographic test. In addition to serology, the polymerase chain reaction can be performed to diagnose the *T. gondii* infection (11).

*Toxoplasma gondii* is widely distributed and highly prevalent globally. It is believed that up to one-third of the world's population lives at risk of this infection (12). Although it is highly prevalent, it has a patchy distribution over 20 countries in the Middle East and North African areas among about 400 million people (13). However, limited data are available on the prevalence of toxoplasmosis in these nations. According to certain studies, the condition is particularly common among women of childbearing age and HIV-positive patients. The *T. gondii* prevalence ranges across the Americas, from 16% in North America to 75% in parts of Middle and South America. In Europe, prevalence rates range from 10% in Iceland to 63% in Poland (13). Some human population studies have been conducted with prevalence rates of up to 50% in Australia and New Zealand. Among China and India, extensive epidemiological investigations have revealed significant prevalence rates in human populations (13). *T. gondii* seroprevalence among Eritrean pregnant women was 53.6% (11). In another study, the seropositive prevalence of *T. gondii* was 33.3% (14) and 27% (15) in Khartoum among Sudanese females. Using the Toxo-Latex Agglutination test, the seropositive prevalence of *T. gondii* was reported to be 68% (16) and 73.3% in Gezira State among Sudanese people (17). The parasite was found to be endemic among humans and domesticated animals in Sudan (18).

We concluded attention should be paid to improvements in management and personal hygiene, awareness raising, control of cats, and avoidance of raw and undercooked meat to reduce the prevalence and control Toxoplasmosis among the population.

#### Authors' Contribution

EAE, KAM, ITO, AMA, AGT, and AAA wrote the original draft. AGT, ADA, and KAM edited and reviewed the article.

#### Conflict of Interests

The authors declare that they have no competing interests.

#### Ethical Issues

Not applicable.

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