

Prevalence of *toxoplasma gondii* in Tuberculosis patients in Sudan

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ABSTRACT: Toxoplasmosis is a zoonotic disease, recognized as a serious public health problem worldwide due to the ravaging HIV/AIDS pandemic. WHO (2003) has reported that tuberculosis (TB) remains the leading cause of morbidity and mortality due to any one infectious agent worldwide. Few publications exist regarding Toxoplasma and tuberculosis co-infection. This study was carried out in Khartoum Sudan to assess *T. gondii* infection in Tuberculosis patients.

Modified latex agglutination test was used for screen of anti-toxoplasma antibodies. Antibodies to *T. gondii* were detected in 11 (17.2%) of the 64 individuals studied.

Toxoplasmosis was higher in males (71.4%) than the females (28.6) and the infection observed in all age groups and was not associated with certain age group. Most of toxoplasmosis infected individuals (72.7%) were consuming meat frequently.

Our finding showed that patients presenting active TB have significantly higher susceptibility to toxoplasmosis infection (25%) compared to active Tb free individuals (11%).

KEYWORDS: Toxoplasma, gondii, tuberculosis, Sudan.

1 INTRODUCTION

Toxoplasmosis is a universal zoonotic disease; approximately 30-50% of the individuals throughout the world have antibodies to toxoplasma gondii. Human infections are acquired through direct or indirect contact with cat feces. Thus, consumption of unwashed vegetables, undercooked meat and unpasteurized milk from infected animals are sources of the infection (1). Human-to-human transfer does not occur except from the primarily infected pregnant woman to her fetus.

In Sudan, toxoplasmosis was reported for the first time in 1966, with different prevalence rates according to the regions and the people's habits (2). Around 65% of Sudanese domestic animals were infected with toxoplasmosis (3). Basic data is important to develop an appropriate control strategy for prevention and treatment of toxoplasmosis. Such data is sparse in Sudanese population.

1.1 OBJECTIVE

This study aimed to evaluate the prevalence of toxoplasmosis among Tuberculosis patients.

2 MATERIAL AND METHODS

2.1 STUDY DESIGN

This is a hospital based case control study, conducted at Alshaab and Abo Anja hospitals, After a verbal consent, demographic data and other socioeconomic data were collected into a pre-designed questionnaire.

2.2 SUBJECTS AND SAMPLES

Sixty four subjects were enrolled in this study. Twenty eight of them were untreated confirmed TB patients and 36 were age and sex matched healthy individuals (included as controls).

Three ml of venous blood were withdrawn in disposable syringes under sterile aseptic technique and centrifuged at 3000 rpm for 10 minutes and serum was collected in a new containers and stored at -20C. Serum was tested for T.gondii specific antibodies using toxoplasmosis latex test kits.

2.3 LATEX AGGLUTINATION KIT

Anti- toxoplasma antibodies was screened using latex test kit (Plasmatec laboratory products, UKA positive result of the first dilution indicates a level of infection greater than 4 IU/ml. Positive and negative controls provided were also tested by the same method to ensure the validity of the kit.

2.4 STATISTICAL ANALYSIS

Data was entered and analysed using SPSS (statistical packaged for social science) computer program

3 RESULTS

In this study sixty four individuals were screened for anti-toxoplasma antibodies. The male: female ratio was 3:1 (Fig. 1), their mean age was (42.3± 17.3) (ranged from 20 to 72 years. The prevalence of toxoplasmosis was found to be 17.2%. (11 out of 64) their titre was > 4 IU. Male was more infected than female, and the infection observed in all age groups and was not associated with certain age group.

The statistically significant differences between meat and liver consumers and non consumers (p. value= 0.01), most of toxoplasmosis infected individuals (72.7%) were consuming meat frequently (Fig. 2). Also high proportion of them was used to drink milk (85.7%) (Fig. 3).

When we classified the studied population into two categories: those with active tuberculosis (Tb) and healthy individuals (age and sex matched controls) we found that there was a high prevalence of toxoplasmosis among Tb patients (25%) compared to the healthy individuals (11%) (Table 1). Those patients (7 in number) aged more than 25 years and 5 of them were males and most of them (6 out of 7) presenting fever and lymph node swelling.

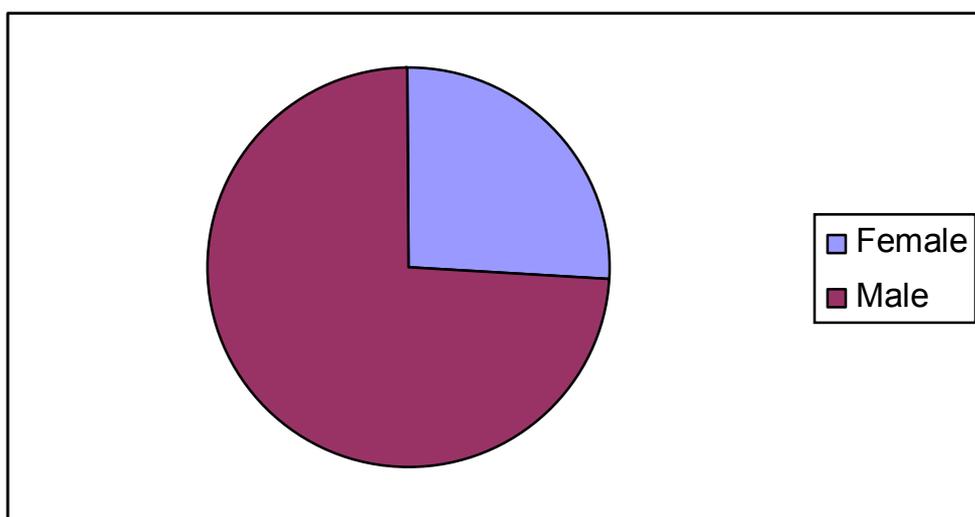


Fig. 1: Sex distribution of the studied patients

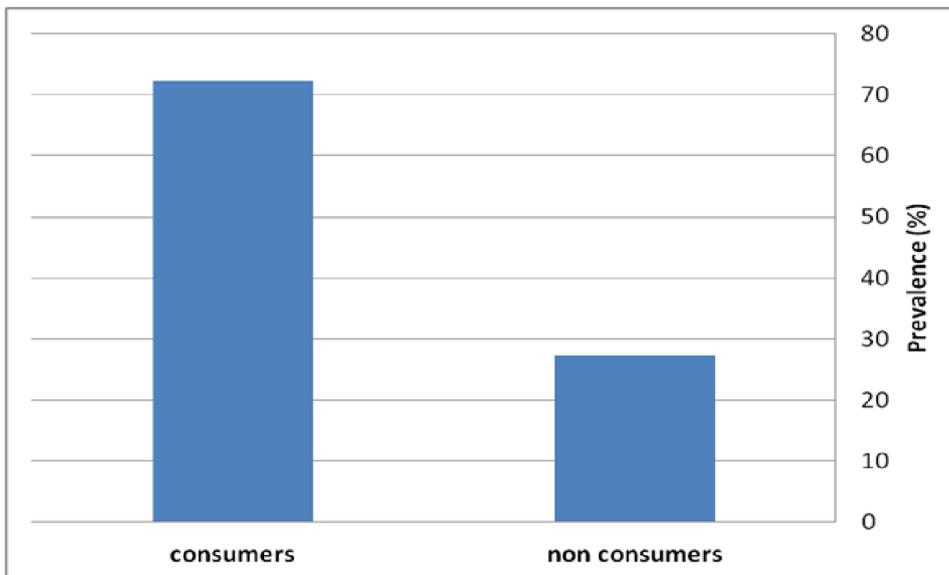


Fig. 2: prevalence of meat and liver consumption in Toxoplasmosis patients

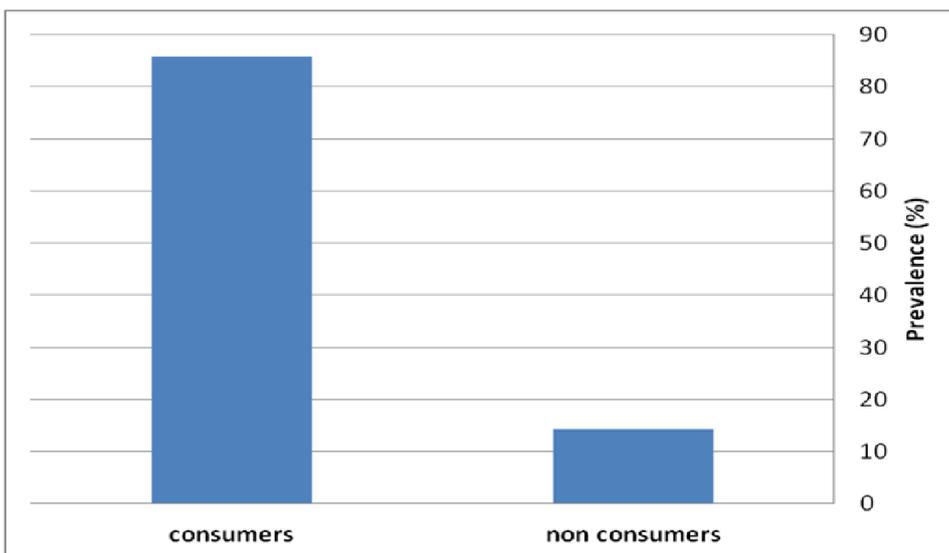


Fig. 3: prevalence of milk consumption in Toxoplasmosis patients

Table 1: Prevalence of toxoplasmosis in Tb patients and healthy volunteers

	Cases	
	NO.	%
Tb patients	7	25
Healthy individuals	4	11

4 DISCUSSION

This study aimed to determine the prevalence of anti-toxoplasma antibodies in TB patients using latex agglutination test. Zhang and Wei (4) reported that Latex Agglutination Test (LAT) could alternatively be used for the diagnosis of toxoplasmosis. Toxoplasmosis antibodies were observed among different age groups since humans may become infected with toxoplasma at any time during life (5). While other previous studies in Nigeria (6) and Congo (7) which found higher seroprevalence rates in

age group (≤ 30 years), and they explained this to an increased exposure of this age group with pet animals (such as cats), poor sanitary habits and probably low level of hygiene during food preparation as a result of low level of awareness of toxoplasmosis.

The result of this study demonstrated a wide evidence of human exposure to *T. gondii* in Sudan. Other studies reported higher anti-toxoplasma antibodies sero-positive rate (34.1%) in pregnant women (8).

T. gondii prevalence was higher amongst males than females this is matched to previous study which indicate that men are more prone to *T. gondii* infection than women (9).

Our finding also show that there was high prevalence of toxoplasmosis in meat and milk consumers, other study show that *T. gondii* infects humans through many different routes, such as ingesting undercooked meat, contaminated food, contaminated water or drinking unpasteurized milk (10). Tenter and his colleagues reported that seroprevalence rates are much higher in populations where ingestion of uncooked meat is common (5). Also this finding is supported by the previous studies in the Sudan, where high rates of toxoplasmosis were related to consumption of raw or partially cooked liver, viscera and undercooked meat (11) (3).

Our finding showed that patients presenting active TB have significantly higher susceptibility to toxoplasmosis infection compared to active Tb free individuals. Cases of *Toxoplasma gondii* and *Tuberculosis* co-infection have been reported in a 4 years old child in Sri Lanka(12).

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