

## The effect of home ground in the prevalence of toxoplasmosis among group of seropositive Sudanese females, Khartoum

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### Abstract:

**Background:** *toxoplasmosis is a disease that results from infection with the Toxoplasma gondii parasite, one of the world's most common parasites<sup>1</sup>. T. gondii has an environmental stage oocysts are shed in cat feces, sporulate, and disperse in the environment, where intermediate hosts get infected. Oocysts are an important source of infection for both animals and humans.*

**Objective:** *The purpose of this study was to determine the effect of home ground in the prevalence of toxoplasmosis.*

**Materials and methods:** *A total of 50 patients diagnosed with toxoplasmosis attending to different hospitals and clinics in Khartoum, Sudan, were enrolled in this study.*

**Results:** *A total of 50 female patients seropositive with toxoplasmosis attending to different hospitals and clinics in Khartoum, Sudan, were asked to the type of home ground which is covered or not covered their ages ranged between 18-48 years, result 48 patients with toxoplasmosis were lived without home ground cover compare to 2 patients lived in homes with covered ground.*

**Conclusion:** *In summary we conclude that the type of home ground was significantly associated increased susceptibility for toxoplasmosis.*

**Key words:** toxoplasmosis, seropositive Sudanese females, Khartoum

## INTRODUCTION

Toxoplasmosis is a disease that results from infection with the *Toxoplasma gondii* parasite, one of the world's most common parasites <sup>(1)</sup> It's an important cause of reproductive failure in man and farm animals resulting in significant socio-economic losses worldwide<sup>(2)</sup>. Toxoplasmosis as other parasitic infections are dynamic in their distribution –some are endemic while many ubiquitous. The environment plays a key role in their survival and transmission often time<sup>(3)</sup>. A toxoplasma infection occur by eating undercooked, contaminated meat (especially pork, lamb, and venison), accidental ingestion of undercooked ,contaminated meat after handling it and not washing hands thoroughly (Toxoplasma cannot be absorbed through intact skin) ,eating food that was contaminated knives , utensils ,cutting boards and other food that have had contact with raw, contaminated meat, drinking water contaminated with toxoplasma gondii, accidentally swallowing the parasite through contact with cat feces that contain toxoplasma gondii, mother –to-child (congenital) transmission, receiving an infected organ transplant or infected blood via transfusion <sup>(4)</sup>, it can be also sexually transmitted infection with serious clinical consequence <sup>(5)</sup>.

In most cases, toxoplasmosis does not cause any symptoms and the person is not aware they are infected but in 10-20% of people infected with toxoplasmosis will develop symptoms similar to flu or glandular fever such as, a high temperature (fever) of 38C or overaching muscle, tiredness, feeling sick, sore throat, swollen glands, these symptoms are

usually mild and will normally pass within a few weeks. Toxoplasmosis can be serious if a women becomes infected while she is pregnant or few weeks before conceiving. This is because there is a chance the infection could be passed to her baby and if the infection spreads to her baby , it can cause ,miscarriage , stillbirth and congenital toxoplasmosis ,that cause serious problems that either noticeable from birth or develop several months or years later, such as brain damage, hearing loss and vision problems<sup>(6)</sup>.

Toxoplasmosis is present in every country and seropositivity rates range from less 10% to 90%. The causative agent, *Toxoplasma gondii*, has a complex life cycle and is an important food borne pathogen. Human infection can result from the ingestion or handling of undercooked or raw meat containing tissue cyst ( bradyzoite ). Alternatively, it can result from direct contact with cats or from the consumption of water or food contaminated by oocysts excreted in the faeces of infected cats <sup>(7)</sup>.

Seroprevalence survey in united states showed that the risk for *T.gondii* infection increased with age and was higher among persons who were foreign –born , persons with a lower educational level , those who lived in crowded conditions , and those who worked in soil –related occupations ,although in subset analyses risk categories varied by race /ethnicity <sup>(8)</sup> .

A CDC study from 2003 showed that in the united states in 1999-2000,16% of the population aged 12 to 49 years carried IgG antibodies against *T.gondii* <sup>(9)</sup> .A study done by Negash T,et al showed that over 50%of interviewed people had a history of consumption raw or under cooked mutton and had close contact with cats <sup>(10)</sup> . A study done by Swai ES,et al showed that antibodies to *T.gondii* were detected in 91(46%) of the 199 individuals studied ,the risk factors associated to toxoplasma infection ,i.e. raw or undercooked mutton consumption and presence of cats appeared significant <sup>(11)</sup>.

A study done by Dhumme M, et al showed that in 23,094 serum samples were tested for T.gondii IgG and IgM antibodies with the use of a solid-phase immunocapture ELISA . Antibodies (IgG) found in 24.3%; (IgM ) antibodies were detected in 2% of the samples .The lowest seroprevalence were detected in the northern parts of India ,with the highest in the south .These data probably reflect the effects of significantly drier conditions and, therefore, a negative impact on the survivability of T.gondii oocysts <sup>(12)</sup> . A study done by Daryani A, et al , showed that the overall seroprevalence rate of toxoplasmosis is among general population in Iran was 39.3%. There was no significant difference in the seroprevalence rate between male and female patients <sup>(13)</sup> .

A study done by Nebiye ,et al showed that of 684 women ,the prevalence of toxoplasmosis was determined to be 58.3% and 1% for IgG and IgM ,respectively .employment as seasonal farm worker, increasing age and having had three or more pregnancies were found to be the crucial associated risk factors that affect the prevalence of T.gondii infection <sup>(14)</sup> .

A study done by Jaqueline ,et al showed seroprevalence of 22.3% by IFAT method . These similar to those obtained by ELISA (24.1%). The seroprevalence was directly estimated from the IgG avidity , which showed that in a sample of 112 students , three of them had acute infection , an incidence of 1.6 in the studied population <sup>(15)</sup> .

A study done by Emmanuelle G, et al showed that from 273 persons ,they estimated seroprevalence to be 47%.That seroprevalence increased with age .The probability of seropositivity tended to be higher in men than in women and in subjects eating raw vegetables at least once a week than in the others <sup>(16)</sup> .

A cross sectional study done by H. Jahani and M.saraei showed that the seroprevalence of T.gondii among 400 un married women was 34%. Mean age was significantly higher in

seropositive women. Seropositivity was highest among unemployed women (38.3%) and lowest among students (22.6%), and was significantly higher in women with less than – high school education. With two-third of these unmarried women seronegative, they represent a high –risk group in pregnancy. Such women need to be educated to prevent congenital toxoplasmosis <sup>(17)</sup>.

Although most immunocompetent individuals infected with toxoplasmosis remain asymptomatic throughout life, worldwide this parasite causes a large amount of visual loss and morbidity, in addition to fatal infections in immunocompromised patients. Hygienic measures are cost-effective and can reduce the chance of transmission <sup>(18)</sup>.

### **Objective:**

The purpose of this study was to determine the effect of home ground in the prevalence of toxoplasmosis among Sudanese patients.

### **Materials and methods:**

#### **Study population**

A total of 50 Sudanese patients with toxoplasmosis from different parts in Khartoum.

#### **Data collection:**

Data were collected from 50 seropositive females from public and private hospitals and clinics in Khartoum state.

#### **Statistical analysis:**

Data of this study was analyzed by statistical package for social sciences (SPSS), correlation between infection with toxoplasmosis and qualitative variables were tested by cross-

tabulation and chi-square test, means of age and duration were compared by anova test.

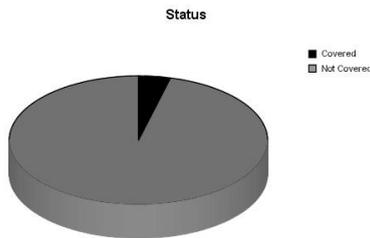
### Ethical considerations

This study was approved by the faculty of medical laboratory sciences, Al Neelain University, and informed consent was obtained from each participant before sample collection.

### Results

Patient with covered home ground	Patient without covered home ground	Total
2	48	50

status	Frequency	Valid Percent
Covered	2	4.0
Not Covered	48	96.0



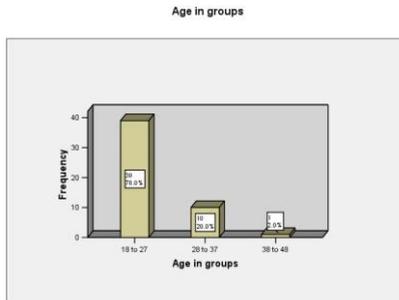
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### Frequencies

Statistics	
Age in groups	
Mean	1.2400
Std. Deviation	.47638

Age in groups
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	Frequency	Valid Percent
18 to 27	39	78.0
28 to 37	10	20.0
38 to 48	1	2.0



Asymp. Sig.	.000
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## DISCUSSION

Toxoplasmosis is one of the most important diseases, which is more commonly diagnosed serologically, predominately in women. Cats defecation behavior, females activities and the cover free home ground contribute in infection with toxoplasmosis. No previous study is conducted to determine the role of the type of home ground in the transmission of toxoplasmosis. The overall findings of our study reflect that there was a significant increase in infection with toxoplasmosis among Sudanese female patients may be due to presence of cover free home ground.

## CONCLUSION:

In summary we conclude that the type of home ground was significantly associated with toxoplasmosis. This work verified the important role of home ground in the infection with

toxoplasmosis by inhalation sporulated oocysts in case flu like symptoms is one of main symptoms in toxoplasmosis and we suppose intimate relation between route of infection and symptoms of the toxoplasmosis .

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