

Diagnostic Accuracy and Predictive Value of Latex Agglutination Test, Rapid Cassette Test Compared To ELISA In Diagnosis of *Toxoplasma Gondii* in Pregnant Sudanese Women

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ABSTRACT

Background: There are different procedures for the diagnosis of the pregnant female suspected with toxoplasmosis, however time, cost, and accuracy of the test should meet patients need.

Material and Method: Three hundred pregnant female collected from Saad Abualila hospital antenatal care unit, were undergo three different procedures for the diagnosis of *Toxoplasma gondii* infection. Toxolatest. Toxo IgG-IgM rapid test and ELISA were done for all pregnant female. The result described as frequency and percentage of positivity, also specificity and sensitivity of Toxolatest. Toxo IgG-IgM rapid test were assessed according to ELISA results.

Results: The sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and diagnostic accuracy for Latex agglutination test to detect *T. gondii* antibodies were: 44.6%, 71.9%, 30.5%, 82.4% and 66. %, while the specificity, sensitivity, PPV, NPV and diagnostic accuracy for rapid cassette test to detect *T. gondii* antibodies were: 29.2%, 88.5%, 41.3%, 81.8% and 75.67%, respectively.

Conclusion: Toxo IgG-IgM rapid test (casset) considered as good test for diagnosis of toxoplasmosis and more specific than Toxolatest with also high diagnostic accuracy.

Keywords: Toxoplasmosis; Pregnancy; Sudan; ELISA; igg; Latex; Rapid test

INTRODUCTION

Toxoplasma gondii (*T. gondii*), is an obligate intracellular single-cell parasite that survives only if infects warm blood animals. It is a global health condition that almost infects almost one-third of total world population [1]. In Sudan, scarce data available about *T. gondii* in total population, however, 34% of the pregnant women were seropositive for Immunoglobulin G anti-toxoplasma antibodies [2]. In general, the major route of infection is the oral route by ingestion of sporulated oocysts in contaminated food or drinks [3]. Trans-placental transmission from the pregnant women to the fetus is another possible route of infection [4]. In women who are infected with *T. gondii* during pregnancy and not treated, the incidence of fetal infection is 25% in the first trimester, 54% in the second trimester and 65% in the third trimester [5]. Pregnant

women infected with *T. gondii* have variable disease outcomes that include miscarriage or stillbirth [6]. Vertical transmission can cause congenital toxoplasmosis, which is characterized by chorioretinitis, hydrocephalus and cerebral calcification [7]. On the other hand, infected pregnant women with *T. gondii* usually asymptomatic and therefore diagnosis can be delayed and adverse outcome may occur [8]. Acute and latent *T. gondii* infections during pregnancy are most commonly diagnosed by detecting the immunoglobulin IgG and IgM in the serum samples of the patients [9]. Thus, early screening and laboratory diagnosis of toxoplasmosis of paramount importance in order to prevent the congenital toxoplasmosis.

Treatment of pregnant women infected with toxoplasmosis reduces the concentration of parasites in the placental tissue and decrease the risk of transmission of infection from mother to fetus [10], and

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Table 2: Performance of rapid test (ICT) relative to ELISA test in diagnosis of toxoplasmosis.

IgG ELISA result				Accuracy measure (95% CI)
Positive	Negative	Total		
Rapid test (ICT) result				
Positive	19	27	46	Sensitivity = 29.2% (19.58 - 41.2)
Negative	46	208	254	Specificity = 88.5% (83.8 - 91.98)
Total	65	235	300	Positive predictive value = 41.3% (28.29 - 55.66)
				Negative predictive value = 81.8% (76.69 - 86.14)
				Diagnostic accuracy = 75.67% (70.51- 80.18)

sensitivity 89.2%, 88% respectively. In comparing the Toxo-latex and Toxo IgM\IgG rapid test (cassette) with ELISA the diagnostic accuracy and positive predictive value was 66%, 75.6%, 30.5%, 41.3% respectively.

This result suggests that there is a fairly agreement of Toxo IgM\IgG rapid test as accurate and specific, which is commercially available for detection of *T. gondii* antibody. Hence, we conclude and recommend that Toxo IgM\IgG rapid test is useful for diagnosis aimed for epidemiological studies of prevalence of toxoplasmosis more than Toxolates. Also, in Thailand in dairy cows, the highest sensitivity was achieved with latex (100%) and specificity varied with values of 91.3% for latex and 100% for PCR in a comparison with indirect fluorescent antibody test in diagnosis of toxoplasmosis [15].

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interests.

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