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Artigo Original

Toxoplasma gondii Prevalence in Pregnant Women in Jataí - GO: a 10-year profile

Prevalência do *Toxoplasma gondii* em Gestantes no Município de Jataí – GO: um recorte de 10 anos

Prevalencia de Toxoplasma gondii en mujeres embarazadas de la Ciudad de Jataí - GO: un período de 10 años

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ABSTRACT

Background and Objectives: Toxoplasmosis is a cosmopolitan zoonosis caused by the *Toxoplasma gondii* protozoan, transmitted mainly through contaminated water or food, beyond vertical transmission. In the State of Goiás, there is a lack of data on the prevalence of the disease, hence the relevance of this cross-sectional study to determine the prevalence of toxoplasmosis in pregnant women in the municipality of Jataí. **Methods:** Data were collected from pregnant women attended by the public health network in the municipality from January 2005 to December 2015. **Results:** During the analyzed period, 11,350 pregnant women were attended; 75% with IgG antibodies and 0,60% IgM antibodies reactive for *T. gondii*, with a reduction in the number of cases since 2010. **Conclusion:** The high seroprevalence found shows that pregnant women are in close contact with factors that trigger the infection and a reduction in the number of cases indicates the efficacy of epidemiological surveillance actions developed for this population group.
Keywords: *Toxoplasmosis. Toxoplasma gondii. Pregnant women. Seroprevalence.*

RESUMO

Justificativa e Objetivos: Toxoplasmose é uma zoonose cosmopolita causada pelo protozoário *Toxoplasma gondii,* transmitido principalmente através de água e alimentos contaminados e pela transmissão vertical. No estado de Goiás existe uma escassez de dados referentes à prevalência da toxoplasmose. Diante dessa realidade, tornou-se relevante esse estudo transversal que determinasse a prevalência da toxoplasmose nas gestantes no município de Jataí. **Métodos:** Foram coletados dados de grávidas atendidas pela rede pública de saúde no município no período de janeiro de 2005 a dezembro de 2015. **Resultados:** No período analisado, foram atendidas 11.350 gestantes, sendo 75% delas com anticorpos IgG e 0,60% anticorpos IgM reagentes para *T. gondii,* com redução no número de casos a partir de 2010. **Conclusão**: A alta soroprevalência encontrada demonstra que as grávidas estão em íntimo contato com os fatores que desencadeiam a infecção. É necessário investigar os fatores que contribuem para a elevada taxa de infecção.
Descritores: *Toxoplasmose. Toxoplasma gondii. Gestantes. Soroprevalência.*

RESUMEN

Justificacíon y Objetivos: La toxoplasmosis es uma zoonosis cosmopolita causada por el protozoo *Toxoplasma gondii*, que se transmite principalmente através del agua o alimentos contaminados, además de la transmisión vertical. Em el estado de Goiás, se carece de dados sobre la prevalência de la enfermedad y ante esta realidade, es relevante este estudio transversal para determinar la prevalência de toxoplasmosis em gestantes del município de Jataí. **Métodos:** Se recolectaron dados de gestantes atendidas por la red de salud pública del município de Enero de 2005 a Diciembre de 2015. **Resultados:** Entre el período analizado se trató a 11.350 gestantes, 75% de ellas com anticuerpos IgG y 0,60% anticuerpos IgM reactivos para *T. gondii,* com uma reducción em el número de casos a partir de 2010. **Conclusión:** La alta soroprevalência encontrada muestra que las mujeres embarazadas están em estrecho contacto com los fatores desencadenantes de la infección y uma reducción em el número de casos apunta a uma eficácia em las acciones de vigilância epidemiológica desarrolladas para este grupo de problación.
Palabras-clave: *Toxoplasmosis. Toxoplasma gondii. Gestantes. Seroprevalencia.*

INTRODUCTION

Toxoplasmosis is an infection caused by the *Toxoplasma gondii* protozoan distributed worldwide and with high prevalence, especially in Brazil, where it has high genetic diversity[1,2]. There are several forms of transmission of this disease, the main ones are the ingestion of oocyst-contaminated food and water and vertical transmission, when there is the passage of tachyzoites from the placenta to the fetus during the three trimesters of pregnancy [3, 4].

Given the high risk of *T. gondii* vertical transmission to the fetus associated with the severity of signs and symptoms of congenital toxoplasmosis, since 2015, the Ministry of Health has assigned the Health Surveillance Secretariat to monitor and supervise

gestational and congenital toxoplasmosis in the country in order to standardize the care provided to pregnant women and their children after proven infection[5]. For this reason, the disease in these conditions was considered an important public health problem and its inclusion in the Compulsory Disease Notification List is an important strategy of this body to monitor the disease. From the investigation of risk cases or proof of gestational transmission, it is possible to identify the origin of the infection and the closure of outbreaks, and create prevention, control and treatment strategies for individuals affected by the disease[5-6].

Symptoms of congenital toxoplasmosis can manifest during fetal development, childhood and even puberty, or the disease can remain subclinical. After infection, the main signs presented by the fetus are chorioretinitis, microcephaly, macrocephaly, hydrocephalus, mental retardation, brain calcifications and even hearing loss[4,7]. Gestational age and primary infection during pregnancy are the main factors responsible for *T. gondii* transmission to the fetus. The acute phase determines the pathogenicity of the parasite in the host, as well as the transmission rate and the severity of the baby's involvement, especially if the mother's infection occurs during the first gestational weeks, as it leads to abortion and several complications[8-9]. Gestational age, in turn, determines the degree of transmission. The frequency of infection of the conceptus during the first trimester of pregnancy is 4.5%, in the second it is 17.3% and in the third trimester it is 75%[4,9-10]. On the other hand, *T. gondii* vertical transmission is considered low in immunocompetent pregnant women who developed seroconversion to the parasite before pregnancy[10].

The prevalence of seropositivity in pregnant women varies according to geographic region, cultural factors, climatic characteristics of the environment, educational level, self-reported color and age[7,10, 11-13]. The worldwide prevalence of toxoplasmosis is 1.1%[7], ranging from 10.9% in Norway[14], 28.88% in Morocco[15] and 30% in Germany[16], with an average of 56.2% in South American countries[7]. In Brazil, it ranges between 32.7% in São Paulo and 92% in Mato Grosso do Sul[10].

In the state of Goiás, data on the prevalence of toxoplasmosis is lacking. Given this reality, this cross-sectional study to determine the prevalence of toxoplasmosis in pregnant women in the city of Jataí became relevant. The lack of this information makes

it impossible to recognize the situation of the disease in the place, and to create and adopt strategies to manage the disease in this group and the population.

METHODS

In this descriptive cross-sectional study, the results of IgG and IgM serological tests for *Toxoplasma gondii* performed in pregnant women attended by the public health network in the municipality of Jataí, state of Goiás, between January 2005 and December 2015 were analyzed.

The test results were provided by the Institute for Diagnosis and Prevention (IDP) of the Association of Exceptional Parents and Friends (APAE), accredited by the state to perform all serological tests of pregnant women assisted by the National Health Service (Brazilian SUS).

The present study was approved by the Research Ethics Committee of the Universidade Federal de Goiás under number 1.882.407 and Certificate of Presentation of Ethical Appreciation 60106616.0.0000.5083.

RESULTS

During the selected period, 11,350 pregnant women were assisted. Of these, 8,514 (75%) had IgG anti-*T. gondii* antibodies (Table 1). The average annual number of cases was 774. A reduction and stabilization in the number of cases was observed after 2010. Pregnant women were significantly associated with seropisitivity of anti-*T. gondii.*

Table 1. Distribution of the number of services and pregnant women with positive IgG and IgM antibodies to *T. gondii* served at the *Rede Cegonha* (antenatal care service) in the municipality of Jataí, state of Goiás, between 2005 and 2015.

Year	Nº	IgG^{+} (%)	IgM (%)
2005	1,090	851 (78.07)	5 (0.46)
2006	961	768 (79.92)	5 (0.52)
2007	1,028	882 (85.80)	9 (0.87)
2008	944	680 (72.03)	12 (1.27)
2009	1,011	843 (83.38)	2 (0.20)
2010	1,043	945 (90.60)	1 (0.09)

2011	1,031	702 (68.09)	6 (0.58)
2012	1,043	707 (67.79)	5 (0.48)
2013	1,065	703 (66.01)	5 (0.47)
2014	1,047	721 (68.86)	12 (1.15)
2015	1,087	712 (65.50)	6 (0.55)
Total	**11,350**	**8,514 (75.01)**	**68 (0.60)**

Among pregnant women assisted at the *Rede Cegonha* during the study period, 68 showed reactivity for IgM anti-*T. gondii* antibodies (Table 2).

In this study, 68 IgM-reactive pregnant women (0.60%) did this test and there was a predominance of cases with avidity >60% (79.41%), suggesting the occurrence of the infection more than 12 weeks before the test was performed, and the IgM found was considered as residual antibody. The opposite of 7.35% and 13.23% of mothers who presented results of avidity < 30% and between 30 - 60%, respectively, suggests maternal infection for less than 12 weeks, with a high possibility of transmitting the parasite to the fetus[9].

DISCUSSION

The percentage of reactivity for *T. gondii* found in the city shows that most pregnant women attended had previous contact with the parasite before conception, reducing the chances of transmission of the disease to the fetus during pregnancy. The prevalence found was higher than that observed in Fortaleza, 68.6%[17], Aracaju, 69%[18], in Jaguapitã (city in the state of Paraná) 66%[19], and in São Luiz (state of Maranhão) 66.38%[20]. Seroprevalence in pregnant women remained high throughout the analyzed period, especially between 2005 and 2010, with a reduction and stabilization of infection in the number of cases after that year, demonstrating that this population is in close contact with factors that promote the infection, and the general population of the municipality may be in the same situation. Faced with this reality, the investigation of factors contributing to the high rate of infection in the population is essential, as well as the creation and implementation of primary measures for protection of the uninfected

population, in addition to secondary and tertiary prevention measures for those who present symptoms and even sequelae of the disease.

The low prevalence of IgM observed (0.60%) was close to that found in studies conducted in Mato Grosso do Sul (0.42%)[21] and Sergipe (0.40%)[22], and lower than rates observed in a reference hospital in Rio de Janeiro (48.8%)[23]. The period from 2008 to 2014 showed a significant increase in the number of cases, with greater evidence in the number of women who tested positive for the IgM anti-*T. gondii* antibody. This situation may indicate an outbreak of toxoplasmosis in the municipality, despite the lack of information to prove such suspicion, since clinical signs of acute toxoplasmosis can be easily confused with other infections and are mostly self-resolving[24]. For this reason, the diagnosis for the disease is often unconfirmed or confused with other infections.

For women who have not had previous contact with *T. gondii*, (24.99%) it is recommended to increase care to avoid contamination by the protozoan, considering the severity of signs and symptoms that fetuses and neonates present when infected in utero.

It is possible to conclude that the municipality of Jataí has a high number of pregnant women who had previous contact with *T. gondii*. The high prevalence of anti-*T. gondii* antibodies in pregnant women points to an important public health problem, because in certain situations, such as the fall of immunological mechanisms of affected individuals, toxoplasmosis can generate serious physiological changes[25].

Knowing the real situation of the disease in the population of the municipality as well as the factors responsible for maintaining the cases is of paramount importance, since even asymptomatic in most cases, toxoplasmosis is an opportunistic infection with serious sequelae when carriers have some type of immunosuppression. Therefore, its monitoring is essential for effective health surveillance actions.

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