Profile of TNF-α and IFN-γ cytokines in pregnant women with suspected toxoplasmosis

Ariella A. Marchioro[1], Fernanda F. Evangelista[2], Bruna T. Tiyo[3], Amanda H. de Souza[4], Lourenço T. Higa[5], Cristiane M. Colli[6], Ana Lúcia Falavigna-Guilherme[6]

[1] PhD student in Health Sciences, State University of Maringá (UEM). Contact: ariella_86@hotmail.com

[2] Master's degree in the Department of Basic Health Sciences, UEM. Contact: fer.evangelista@hotmail.com

[3] Master's degree in Biosciences and Pathophysiology Contact: bruna.tiaki@hotmail.com

[4] Graduation Student in Biology, UEM Contact: amanda-hinobu@hotmail.com

[5] PhD Professor in the University hospital of Maringá - UEM Contact: lourencohiga@gmail.com

[6] Department of Basic Health Sciences Contact: criscolli@yahoo.com.br Contact: alfguilherme@uem.br

Toxoplasmosis is a zoonosis caused by the protozoan *Toxoplasma gondii*, with approximately 80% of the infected world population. It is transmitted through ingestion of water, fruits and vegetables contaminated by oocysts, ingestion of cysts present in animal products and congenital transmission by tachyzoites. These structures can reach the fetus and when enlisting, causing subclinical injuries or central nervous system lesions, chorioretinitis and intrauterine death. Because it is dealing of an intracellular parasite, the interferon-gamma (IFN-γ) is considered the main mediator of resistance against *T. gondii*. High levels of this cytokine stimulate the Th1 cell response, which activates macrophages and promotes cytotoxic activity in other cells, enabling the elimination and inhibition of tachyzoite replication. The cytokine tumor necrosis factor α (TNF-α) acts synergistically in the inflammatory process and stimulates microbicidal activity. Evaluate the profile of TNF-α and IFN-γ cytokines in pregnant women with suspected toxoplasmosis, comparing them with the group of healthy, high and low avidity pregnant women. Twenty-five pregnant women were investigated and 17 of whom presented low avidity and 8 high avidity from the University Hospital of Maringa High Risk Pregnancy Outpatient Clinic. After agreement and signing of the consent form in a free and informed manner, the patient's blood was collected, and the serum and plasma obtained were stored in the same day at -20ºC until the time of dosing. The control group were consisted of pregnant women who presented non-reactive IgG and IgM antibodies to *T.gondii*. The cytokines TNF-α and IFN-γ were settled by enzyme-linked immunoenzymatic assay (ELISA), according to the instructions of the manufacturer of the Bioscience kit (USA). The concentration of cytokines was setlled by reference to the standard curve for serial dilutions and optical absorbance measured at 450 nm.A análise estatística foi realizada utilizando o software GraphPad, e os

resultados foram expressos como médias aritméticas e as diferenças entre os grupos analisados por teste T Student, e os dados não paramétricos por Mann-Whitney. The statistical analysis was performed using the GraphPad software, and the results were expressed as arithmetic means and the differences between the groups analyzed by T Student test, and the non-parametric data by Mann-Whitney. All data were verified by the Grubbs test (GraphPad Quickcalcs) for identification and elimination of possible points of influence, outliers ($p < 0.05$). A significance level of 5% was considered. TNF-α cytokine levels were lower in infected pregnant women, even at low ($p = 0.0485$) or at high avidity ($p = 0.0472$) when compared to uninfected pregnant women. Regarding IFN-ɣ, low-avidity pregnant women presented higher levels than those with high avidity ($p = 0.0327$), but close to that observed in pregnant women in the control group ($p = 0.3990$). Reduced levels of TNF-α among infected pregnant women (low and high avidity) in relation to uninfected pregnant women favor *T. gondii* susceptibility. Concerning IFN-γ, which is a cytokine produced mainly by T, B and NK cells, it has immunomodulatory function, and was observed in lower concentrations in pregnant with high avidity, suggesting a risk of exacerbation in pregnant women.

Presenter: Fernanda Ferreira Evangelista.

Contact: fer.evangelista@hotmail.com

Financial support: Fundação Araucária e CNPq.