

Acute *Toxoplasma gondii* infection causes reduction of nitrergic neurons in the myenteric plexus of the duodenum in Wistar rats

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Toxoplasmosis is an infection caused by the *Toxoplasma gondii* parasite. It is transmitted mainly by the ingestion of foods containing oocysts. Thus, the parasite needs to transpose the intestinal epithelium to enter the host organism. In the chronic phase, *T. gondii* forms cysts in the nervous tissue. In the digestive tract the enteric nervous system is present and the nitric oxide (NO) is one of the main inhibitory neurotransmitters acting in this system. The goal of this study was to evaluate the density of nitrergic neurons subpopulation in the myenteric plexus in the duodenum of Wistar rats submitted to acute infection by *T. gondii*. The experimental protocol was approved by the Ethics Committee in Animal Experimentation of the State University of Maringá, under protocol 079/2013. Fifteen male Wistar rats, with 60 days of age (n = 5), were distributed into: a control group (CG), which received saline solution, and two groups, one infected for 48 hours (G48) and the other for 7 days (G7d). They received a suspension containing 5000 sporulated oocysts of the parasite (strain ME-49) orally. After euthanasia, the duodenum was collected, and their myenteric plexuses dissected and processed for immunohistochemical staining technique of the nNOS-immunoreactive sub-population nitric neurons. We count the number of immunoreactive nNOS neurons in images of 50 microscopic fields (20x objective) obtained by a optical microscope integrated with FSX100 Olympus Image Navigator. We carried out the quantification of immunoreactive nNOS neurons in Image-Pro Plus. The statistical analysis was done with the Bioestat 5.3 software and the results were expressed as mean \pm standard deviation. There was a reduction in the number of neurons in the sum of the fields in the groups G48 (550.2 ± 37.77 neurons) and G7d (555.7 ± 39.98 neurons), when compared with the CG (640.6 ± 60.13 neurons) ($p < 0.05$). NO is a neurotransmitter used by enteric neurons and represents an important compound in the parasite control by inhibiting mitochondrial and nuclear enzymes, preventing the *T. gondii* replication. The excess of NO resulting from the infection may be cytotoxic not only to the parasite but also to host cells, including neurons (BRUNET, 2001), which might explain the reduction in this subpopulation density. A study with chronic infection by *T. gondii* oocysts presented different results, showing an increase in the nitrergic subpopulation in the myenteric plexus in the jejunum of rats (VICENTINO-VIEIRA et al., 2015). Therefore, there is a decrease in nitrergic neuronal density in the myenteric plexus of the duodenum of Wistar rats after 48-hour and 7-day *T. gondii* oocysts infection. Funding: CAPES.

BRUNET, L. R. Nitric oxide in parasitic infections. **Int Immunopharmacol**, v. 1, n. 8, p. 1457-67, 2001.

VICENTINO-VIEIRA, S. L. et al. Oral dependent-dose toxoplasmic infection model induced by oocysts in rats: myenteric plexus and jejunal wall changes. **Exp Parasitol**, v. 156, p. 12-8, 2015.