Hypertrophy of submucosal neurons in the duodenum of Wistar rats submitted to acute infection by *Toxoplasma gondii*

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Toxoplasma gondii is the parasite that causes Toxoplasmosis, one of the most common parasitic infections in homeothermic animals. The main route of infection is through the ingestion of food or water contaminated by oocysts. The parasite crosses the intestinal barrier to spread throughout the body, and it is known that this parasite can lead to cysts formation in the nervous tissue in chronic infection. The objective of this work was to evaluate the morphometry of submucosal neurons present in the duodenum of Wistar rats infected with *T. gondii* for 7 days. The experimental protocol was approved by the Ethics Committee in Animal Experimentation of the State University of Maringá (079/2013). Male Wistar rats (60 days of age) were distributed into two groups (n=5): control group (CG), which received saline, and a group infected for 7 days (G7d), which received a suspension containing 5000 sporulated oocysts of the parasite (strain ME-49) orally. After euthanasia the duodenum was collected and submucosal plexus was dissected and processed for the immunohistochemical staining technique for the HuC/D protein in neurons. We measured the areas (μm^2) of 100 cell bodies of submucosal HuC/D-IR neurons per animal. The morphometry of these neurons was performed in the Image-Pro Plus software, using 20x objective images, obtained with as FSX100 Olympus Image Navigator with an integrated microscope. Statistical analyses were done with Bioestat 5.3 software and the results were expressed as mean ± standard deviation. We observed an increase in the cell body area of HuC/D-IR submucosal neurons present in the duodenum of G7d rats (289.86 ± 51.63 μm^2) when comparing to the CG animals (280.50 ± 73.61 μm^2) ($p<0.05$). This hypertrophy could be explained as neurons adaptation, since they increase their nuclear metabolism and their protein synthesis to guarantee their neuronal function (CARRUTHERS; SUZIKI, 2017), in order to compensate for a possible loss of other neurons due to *T. gondii* infection. Direct parasitism could also explain structural and functional changes in neurons (WEISS; KIM, 2007). Hypertrophy was also observed in a study with myenteric neurons in the ileum of rats infected for 24 hours with tissue cysts (SUGAUARA et al., 2009). Therefore, acute infection by *T. gondii* oocysts causes hypertrophy of the total population of submucosal neurons in the duodenum of rats. Funding: CAPES.

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