Acute infection induced by Toxoplasma gondii causes changes in collagen fibers in the jejunum of rats

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Toxoplasma gondii causes relevant zoonosis in public health worldwide, reaching levels of 5-80% of the world's human population. We aimed to investigate the effects of acute infection caused by T. gondii oocysts on collagen fibers and mast cells in the jejunum of rats. The experimental protocol was approved by the Ethics Committee on Animal Use of MSU (n ° 079/2013). Twenty-eight male Rattus norvegicus, Wistar, male, 60 days old were used. Rats were randomly assigned to GC (control group); G12 (12 hours of infection); G24 (24 hours of infection) and G48 (48 hours of infection). Rats from the infected groups received 5,000 sporulated oocysts of T. gondii (strain ME-49) orally. After the experimental periods, the rats were submitted to euthanasia, the jejunum was removed, measured, washed and fixed. Semi-serial transverse sections of 4 μm were stained according to the picrosirius technique to show the types of collagen and according to Toluidine Blue technique for total mast cell staining. Sixteen polarized images per animal were captured and analyzed on 20x objective with optical microscope coupled to Image Pro Plus Software®. The percentage of collagen type I and type III was evaluated and mast cells were quantified in 100 microscopic fields in 4 semi-serial sections per mouse in 100x objective. The data were analyzed statistically by the ANOVA test using GraphPad Prism Software 5.01®. The toxoplasmic infection reduced the amount of collagen type I after 12h (2.42 ± 0.56 collagen/μm²), 24h (3.25 ± 0.88 collagen/μm²) and 48h (3.15 ± 0.90 collagen/μm²) compared with the GC (4.14 ± 1.26 collagen/μm²). Even though type III collagen reduced after 12h (1.94 ± 0.31 collagen/μm²), there was an increase after 24h (3.72 ± 1.13 collagen/μm²) and 48h (3.57 ± 1.06 collagen/μm²) the infection when compared with GC (2.98 ± 0.75 collagen/μm²). Mast cells had no significant alterations in number after 12h (29.73 ± 3.43 mast cells/mm²), 24h (24.08 ± 1.13 mast cells/mm²) and 48h (33.05 ± 4.80 mast cells/mm²) 3.07 mastocytes/mm²). Fibroblasts are cells involved in healing and its main function is the production of collagen, which is the predominant component of the extracellular matrix (KANTA, 2015). In our study, it was possible to observe a remodeling of these proteins with an increase in type III collagen. It is concluded that the acute infection caused by T. gondii reduces the amount of type I collagen fibers and increases the amount of collagen type III in the jejunum of rats. Possibly this variation in the types of collagens reflects the dynamics of the inflammatory process, since we observe cellular infiltrates in the connective tissue. Thereafter, it was possible to observe the formation of new fibers, restoring the tissue structure. As for mast cells, there was no significant change in the number of these cells.
however, there is a small increase due to the accumulation of polymorphonuclear cells suggesting mobilization of mast cells at the infection site, promoting cell recruitment.

**Category:** Protozoology - Biology and ultrastructure

**Reference**