The effect of T-2 toxin on percentages of CD4⁺, CD8⁺, CD4⁺CD8⁺ and CD21⁺ lymphocytes, and mRNA expression levels of selected cytokines in porcine ileal Peyer’s patches

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Abstract

The immune system is one of the main toxicity targets of the T-2 toxin. In view of scant research data demonstrating the effect of T-2 on cellular and humoral responses in gut-associated lymphoid tissue (GALT), this study set out to investigate the effects of chronic exposure to low doses of the T-2 toxin (200 μg T-2 toxin kg⁻¹ feed) on percentages of CD4⁺ and CD8⁺ T lymphocytes, CD4⁺/CD8⁺ double-positive T lymphocytes, CD21⁺ B cells, and IL-2, IFN-γ, IL-4 and IL-10 mRNA expression levels in porcine ileal Peyer’s patches. The investigated material comprised ileum sections sampled from piglets (aged 8-10 weeks, body weight of 15-18 kg) on days 14, 28 and 42 of the experiment.

After 42 days of exposure to T-2, a significant drop in the quantity of the IL-10 product was observed (R=0.94; S.E. 0.49-0.79; p<0.001). A gradual decrease in the amount of IL-4 and IFN-γ cytokine transcripts was found throughout the experiment, but the reported trend was not significant. On experimental days 14 and 42, a significant increase in the percentage of CD8⁺ T lymphocytes was observed in comparison with the control (p=0.04 and p=0.05, respectively), whereas on day 28, a significant decrease in the percentage of the above subpopulation was noted (p=0.00). The percentage of CD21⁺ B cells in the experimental group decreased steadily in comparison with the control, and the observed drop was significant on days 28 and 42 (p=0.06 and p=0.00, respectively). On days 14 and 28, the percentages of CD4⁺ and CD8⁺ T lymphocytes were lower in the experimental animals than in the control group, and the drop reported on day 28 was statistically significant (p=0.03).

Key words: T-2 toxin, pigs, Peyer’s patches, lymphocyte subpopulation, qPCR, immunology

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