THE SUSCEPTIBILITY TO TRYPANOSOMA CRUZI INFECTION IS AFFECTED BY THE SYMPATHETIC NERVOUS SYSTEM: ROLE OF GENDER

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Chagas' disease (American trypanosomiasis) is caused by infection with the intracellular parasite *Trypanosoma cruzi* (*T. cruzi)*. This disease is a major health problem in Latinamerica, but it is rapidly extending to the rest of the world, thus becoming a global health problem in this century. Using a murine model, we studied whether the sympathetic nervous system (SNS) can affect the course of *T. cruzi* infection and the sexual dimorphism observed in the disease. On a C57Bl background, around 50% of the infected females survive for longer than 24 days, while all males are dead by this time. We found that the splenic concentration and content of noradrenaline, the main sympathetic neurotransmitter, is markedly decreased and is paralleled by a reduction of splenic noradrenergic nerve fibers in infected mice. These alterations are more marked in males than in females. Advancing the spontaneous loss of noradrenergic nerve fibers by chemical sympathectomy prior to infection resulted in an even earlier death of males, and significantly increased mortality in females. We also evaluated the concentration of IgM and IgG_{2a} antibodies specific to *T. cruzi* because IgM antibodies are particularly increased in mouse strains that are more resistant to this infection, while IgG2a antibodies are increased in mice of more susceptible strains. No significant effects of chemical denervation on the concentration of these specific antibodies to *T. cruzi* were detected. Although sympathectomy did not worsen myocarditis, it resulted in increased parasitemia and IL-6 and IFN-γ blood levels. The results suggest that the SNS might favor survival to *T. cruzi* infection by mechanisms that most likely involve the control of excessive production of certain pro-inflammatory cytokines. As a whole, the data obtained in this model of parasitic disease provide further indications of the relevance of interactions between the immune system and the SNS for host defense.