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COMMUNICATION

Effect of *Trypanosoma lewisi* (Kinetoplastida: Trypanosomatidae) on the infection of white rats with *Toxoplasma gondii* (Eucoccidia: Sarcocystidae) oocysts

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Abstract: White rats were inoculated with 10^6 trypomastigotes of *Trypanosoma lewisi,* simultaneously or two days before and after inoculation with 10^5 oocysts of *T. gondii.* A greater number of cysts was found in the brain of the animals having concomitant inoculations, as compared with rats inoculated with either one of the two parasites. An apparent immunosuppressive effect is likely. Since both organisms can be found in rats, it is possible that infections with *T. lewisi,* could make this rodent another intermediate host for *Toxoplasma* infections.

Key words: *Toxoplasma gondii, Trypanosoma lewisi,* immunosuppression, synergism, rats.

The rat, natural host of *Trypanosoma lewisi* as well as a satisfactory model of *Toxoplasma gondii* infection of human origin, is naturally resistant to this parasite (Ruchmand & Fowler 1951, Lainson 1955, Chinchilla *et al.* 1981). We have studied the interactions of both parasites in concurrent infections (Guerrero *et al.* 1997). In this paper we described an apparent *T. lewisi*-induced immunosuppression which enhanced *T. gondii* multiplication using tachyzoites to infect the animals. Since ingestion of oocysts appears to be the natural infection way in this coccidian (Frenkel *et al.* 1970), several experiments were designed to explore if *T. lewisi* had any similar effect to that found for tachyzoites, on oocysts infections in the white rat. For the experiments, 35 Wistar white rats (100g body weight) were inoculated intraperitoneally with 10^6 *T. lewisi* trypomastigotes and 10^6 *T. gondii* oocysts obtained according to the Dubey *et al.* procedure (1970). Five groups of seven rats each were separated and infected acoording to the next scheme:

Group 1. *T. gondii* oocysts inoculated two days before *T. lewisi* infection.

Group 2. Simultaneous infection with oocysts of *T. gondii* and trypomastigotes of *T. lewisi.*

Group 3. *T. gondii* oocysts inoculated two days after *T. lewisi* infection.

Group 4. *T. gondii* oocysts infection only.

Group 5. *T. lewisi* trypomastigotes infection only

Survival time of all animals was measured in 30 d and animals were killed to search an count *Toxoplasma* cysts in brains. Parietal and frontal lobes portions (total three) were weighted and the number of cysts were determined, to calculate the number per gram (Holst and Chinchilla 1990).

The Tukey HSD test was used for the statistical analysis.

Rats inoculated either with *T. gondii* (gr.4) or *T. lewisi* (gr.5) did not present *Toxoplasma* cysts; many rats infected with both parasites (groups, 1,2,3) had evolutive stages of *T. gondii* (averages number ranged between 221 to 895 cysts).

There was a slight difference between groups 4 and 5 as compared with groups 1, 2 and 3 (P=0.09), but no difference between groups 1, 2 and 3.

Apparently there are less brain cysts in animals inoculated with *T. gondii* after trypanosome infection, but this is not statistically significant. However, we believe that this is a biological phenomenom: animals are used as the experimental unit and the cyst distribution is not homogeneous, therefore by increasing the number of rats, differences between groups 1, 2 and 3 might become significant.

Our results suggest that *T. lewisi* infections induce an increase of *Toxoplasma* multiplication in the rats after oocyst ingestion. This finding is interesting from the immunological and epidemiological point of view. Immunosuppression in trypanosome models has been found. Darji *et al* (1992) explained the mechanisms for that effect in African tripanosomes. Later, the role of gamma interferon in this phenomenon was considered (Darji *et al.* 1996), and Chanon and Kasper (1996) have found that *T. gondii* induces immunosuppressive factor such as gamma interferon. Something similar could happen for our model with *T. lewisi.* On the other hand, although mice are the first source of *T. gondii* infection for cats (Frenkel 1973), rats may become naturally infected in the wild with this parasite (Chinchilla 1978) in spite of their innate resistance (Chinchilla *et al.* 1981). Since *T. lewisi* is a natural parasite for this rodent, it could increase the number of brain cysts, making the rat an important *Toxoplasma* infection source for cats.

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