

# TOXOPLASMOSIS IN VETERINARIANS: AN INVESTIGATION INTO POSSIBLE SOURCES OF INFECTION

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## INTRODUCTION

TOXOPLASMOSIS in man may be considered to be acquired from three sources; by congenital infection, by ingestion of undercooked infected meat, or by accidental ingestion of *Toxoplasma* oocysts shed by cats (6). The relative importance of the latter two sources is not known. Epidemiological surveys designed to clarify the matter have yielded contradictory results (2, 5). While veterinarians would not be expected to differ from the general population in their meat eating habits it was considered that this profession might be at increased risk through continued exposure to cats.

## MATERIALS AND METHODS

In the survey reported here, 28 veterinarians working in the Department of Clinical Studies at this university were tested for the presence of antibodies to *Toxoplasma gondii* by the Sabin-Feldman dye test. A group of 28 faculty members from the Department of Chemistry were tested for control purposes. The average age of the veterinarians was 36.7 years, and that of the chemists was 37.8 years. Each person tested provided details of their present and past pet ownership. In addition the veterinarians were asked about their current and previous practice experience.

Serum samples were heat inactivated and tested using a standard Sabin-Feldman technique (8) with human accessory factor. All samples were first tested at a dilution of one-quarter and those reacting positively at that dilution were then titrated out.

## RESULTS

The results obtained are summarized in Figure 1. Out of 56 serum samples tested, eight contained antibodies to *T. gondii*. Of the eight positive samples, six were from veterinarians and two from chemists. All six veterinarians who had a positive serological reaction are currently large animal practi-

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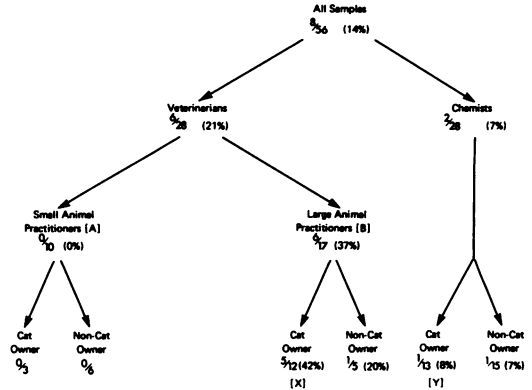


FIGURE 1. A summary of the results obtained by testing 28 veterinarians and 28 chemists for antibodies to *T. gondii*. The difference between A and B and between X and Y are statistically significant ( $P > 0.05$  and  $P > 0.01$  respectively).

tioners. No veterinarian engaged in small animal practice was serologically positive.

In investigating the role of pet ownership, it was observed that among the control group, cat ownership carried with it no additional risks. Among the veterinarians cat ownership did appear to be related to the prevalence of anti-toxoplasma antibodies. However, further analysis showed that twelve out of seventeen large animal practitioners had cats as pets while only three of the small animal practitioners had. Presumably exposure to felines during working hours is reflected in a reluctance to have them as pets.

## DISCUSSION

On the basis of this study, we conclude that cat ownership, in the groups tested, did not result in an increased risk of acquiring toxoplasmosis. We do conclude however, that large animal practitioners but not small animal practitioners in this group are at increased risk. This feature is comparable with the findings of Fox and Campbell (3) who, in a survey of small animal practitioners in San Francisco showed that these individuals are at no greater risk than the population at large.

Oocysts, after shedding require at least 24 hours in order to sporulate and hence become

infectious (4). For this reason, persons who handle cats transiently, and have a high standard of personal hygiene are unlikely to acquire infection.

If, as is suggested by this data, large animal veterinarians are at increased risk, it is pertinent to determine the source of this risk. In this region approximately 50% of cattle and sheep and 20% of pigs possess antibodies to *T. gondii*. It is difficult to see how infection could be acquired from these animals. We hypothesize, however, that farm cats, kept primarily to control farm rodent populations, are the most probable source of infection. Two outbreaks of toxoplasmosis on farms in eastern Canada were probably initiated by infected cats (1, 7). Veterinarians engaged in farm animal practice are occasionally called to treat these animals and we suspect, are in this way exposed to infectious oocysts.

#### SUMMARY

The prevalence of antibodies to *Toxoplasma gondii* was compared in veterinarians working in the Department of Clinical Studies, and chemists from the Department of Chemistry, University of Guelph. The results obtained suggested that large animal practitioners were at increased risk relative to small animal practitioners and chemists. Some possible reasons for this are discussed.

#### RÉSUMÉ

Cette expérience visait à comparer le taux d'anticorps à l'endroit de *Toxoplasma gondii*, chez des vétérinaires du département des études cliniques, ainsi que chez des chimistes

du département de chimie, à l'université de Guelph. Les résultats de l'étude laissent supposer que les praticiens des grands animaux courraient un plus grand risque que les praticiens des petits animaux et les chimistes. Les auteurs commentent certaines raisons qui expliqueraient ce fait.

#### REFERENCES

1. BEAUREGARD, M., S. E. MAGWOOD, G. L. BANNISTER, A. ROBERTSON, P. BOULANGER, G. M. RUCKERBAUER and M. APPEL. A study of toxoplasma infection in chickens and cats on a family farm. *Can. J. comp. Med.* 29: 286-291. 1965.
2. COMSTOCK, G. W. and J. P. GANLEY. Association of toxoplasmosis and cats. *Am. J. Epidemiol.* 97: 424. 1973.
3. FOX, J. G. and L. H. CAMPBELL. Serological survey of toxoplasmosis in a selected population of veterinarians in California. *Calif. Vet.* 28: 32-35. 1974.
4. FRENKEL, J. K. and J. P. DUBEY. Toxoplasmosis and its prevention in cats and man. *J. infect. Dis.* 126: 664-673. 1972.
5. PETERSON, D. R., E. TRONCA and P. BONIN. Human toxoplasmosis prevalence and exposure to cats. *Am. J. Epidemiol.* 96: 215-218. 1972.
6. QUINN, P. J. and B. M. McCRAW. Current status of toxoplasma and toxoplasmosis: A review. *Can. vet. J.* 13: 247-262. 1972.
7. ROSSIER, E., P. DEBOSSET, T. BITTER, S. F. FLORIAN and J. A. MCKIEL. Toxoplasmosis in a farmer's family and in the Eastern Townships, Province of Quebec. *Can. J. publ. Hlth* 65: 437-442. 1974.
8. SABIN, A. B. and H. A. FELDMAN. Dyes as microchemical indicators of a new immunity phenomenon affecting a protozoan parasite (*Toxoplasma*). *Science* 108: 660-663. 1948.

#### EXTRACTS FROM DIALOGUE

Dr. M. A. Bernard gives the surgical procedure followed in the removal by hysterectomy of a lesion in the uterus of an 18 month old squirrel monkey. The lesion proved to be adenomyosis and endometrial hyperplasia.

As an aside Dr. Bernard emphasizes what the Journal espoused, that exotic pets should be subject to strict control and that the vet-

erinary profession should discourage the general public from keeping them.

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