

SHORT COMMUNICATIONS

INCIDENCE OF TOXOPLASMOSIS IN DOMESTIC ANIMALS IN AFGHANISTAN

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Abstract. The authors investigated a total of 435 domestic animals in Afghanistan by micromodification of indirect hemagglutination test. Camels showed the highest incidence of infection (73.7%). Of 9 zebu 3 were positive. The incidence of infection in goats was 31.6%, in sheep 20.4%, in buffaloes 20.4%. The lowest percentage of positive titres was detected in cattle (15.7).

The results obtained in screening the human population in Afghanistan by toxoplasmin (Šerý et al. 1959, Šerý 1974) and hemagglutination tests (Buck et al. 1972, our findings 1975), indicated that incidence of toxoplasmosis might also be relatively high in animals. We therefore directed our attention to the demonstration of toxoplasma antibodies in some domestic animals, as such data were lacking until recently.

MATERIAL AND METHODS

We examined blood samples of 435 domestic animals slaughtered at the abattoir in Kabul in April, September and October 1974. The animals came from the provinces of Badakhshan, Baghlan, Bamiyan, Chazni, Kabul, Kunduz, Nengrahar, Paktiya and were represented by 171 goats, 117 sheep, 70 cows, 49 buffaloes, 19 camels and 9 zebu. Mixed blood from jugular veins and carotid arteries was collected on filter paper until the latter was perfectly soaked. The dried blood stains were transported to laboratory and kept at a refrigerator at 4 °C until examination. Sera were obtained by the method described by Kramář (1965).

Antigen was prepared by tween-ether preparation after Pokorný et al. (1971) from tachyzoites of *Toxoplasma gondii* strain isolated from the organs of a child who died of congenital toxoplasmosis in 1958. We used dried ram erythrocytes with formalin and tannin in 1% concentration, the preparation SEVATEST TK-HEM SEVAC Praha. We employed microtitration method, using droppers and dilution loops of 0.025 ml manufactured by METRIMPEX Budapest. In the test proper we used the technique described by Lewis and Kessel (1961). Readings of reaction were done after 4 hours, using mirror manufactured by Cooke Engineering Co., USA. All samples were first examined at dilutions up to 1:64. The positive ones at this titre were examined once more at higher dilutions.

RESULTS AND DISCUSSION

No domestic animals have been tested for toxoplasmosis in Afghanistan to date and therefore our results may be compared with data concerning relevant animal species in neighbouring regions. It should be kept in mind, however, that indirect hemagglutination test offers only a survey of the incidence of toxoplasmosis in a certain population and the titres revealed cannot be reliably compared with the level of antibody titres detected in other tests. Although the determination of titre level in the method of blood stains on filter paper is not quite accurate, it may be said, that low antibody titres detected in most cases investigated indicate a latent infection and not a florid disease.

In camels in our group positive titres were found in 14 of 19 tested. Gershkevich (1962) revealed complement fixation antibodies in 1 of 16 camels tested in Turkmenistan. Golosov and Gorbunova (1965) tested 124 camels and found complement fixation antibodies in 23.3% of reagents. There were considerable differences in infection rates in different herds and between old and young camels in the same herd. There is a lower percentage of positive camels from zoos in the German Democratic Republic which we have been testing at the present time (27.8%). An unusually high percentage of positive reagents in our group in Afghanistan was not surprising as they were old animals of nomads or seminomads.

Of 9 zebu and 49 buffaloes tested 3 and 10 animals were positive respectively. Zebu and buffaloes were also examined by Šerý et al. (1959) in the Democratic Republic of Vietnam by complement fixation test. All 30 zebu tested were negative, of 21 buffaloes 2 animals revealed complement fixation antibodies. 15.7% of cattle tested by us showed positivity. Galuzo et al. (1965a) examined 692 head of cattle by CFT and 13.6% proved to be positive.

We found 21.4% of positive reagents among sheep. In Uzbekistan Rakhimov et al. (1971) detected complement fixation antibodies in 7.4% and Ermakova (1974) in 13.2%, in the Turkmen SSR Berd'yev (1972) in 7.8% of sheep. In India Gill and Prakash (1970) revealed hemagglutination antibodies in 9% of 488 sheep tested. The incidence of infection disclosed by us in sheep in Afghanistan was higher than that detected by Soviet authors in regions of the USSR with conditions similar to those in Afghanistan.

The incidence of infection rate in goats of our group was 31.6%. Galuzo et al. (1965b) found a half of this percentage in 1826 goats in Kazakhstan investigated by complement fixation test.

Table 1. Results of investigation for toxoplasmosis of 435 domestic animals by indirect hemagglutination test

	Results of indirect hemagglutination test									Total positive	
	Total tested	Neg.	16	32	64	128	256	512	1 024	Number	Percentage
Camels	19	5	4	4	2		2	1	1	14	73.7
Zebu	9	6	2	1						3	33.3
Goats	171	117	37	10	5	2				54	31.6
Sheep	117	92	9	7	6	3				25	21.4
Buffaloes	49	39	7	2	1					10	20.4
Cattle	70	59	6	3	2					11	15.7
Total	435	318	65	27	16	5	2	1	1	117	26.9

A relatively high percentage of toxoplasmosis incidence in domestic animals in Afghanistan, primarily in camels, is probably associated with the way of life of the inhabitants and with the character of animal husbandry. Many families live in close contact with domestic animals and also individual animals, mainly in winter season, are in close contact. If we consider that infection by tachyzoites may occur only in the course of parasitemia (Laven and Westphal 1950), this mode of infection in inter-animal cycle is probable as an exception only. A certain role may be played by congenital transmission. An important source of infection for domestic animals may be the cat (and perhaps some other cat-like carnivores) which eliminates with its feces

toxoplasma oocysts which are very resistant to outer influences. The oocysts remain to be infectious in humid environment as long as one year. It is believed (Kutschmann et al. 1974) that every other cat eliminated oocysts at some time. In Afghanistan country side the cat is the most widespread domestic animal and lives practically in every house. In Kabul itself about 10 % of homes keep a cat (Šerý 1974). It is therefore likely that it represents a source of infection for other domestic animals and for man as well.

ПОРАЖЕННОСТЬ ТОКСОПЛАЗМОЗОМ ДОМАШНИХ ЖИВОТНЫХ В АФГАНИСТАНЕ

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Резюме. Авторами обследовано всего 435 домашних животных в Афганистане при помощи микромодификации непрямой реакции гемагглютинации. Самая высокая пораженность оказалась у верблюдов (73,7 %). Из 9 зебу 3 оказались положительными. Пораженность выявлена у 31,6 % коз, 21,4 % овец, 20,4 % буйволов. Самый низкий процент положительных титров установлен у скота (15,7 %).

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