

Research Note

Prevalence of *Echinococcus multilocularis* in out door cats in West Bohemia (Czech Republic)

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Summary

The definitive hosts of *E. multilocularis* are, besides the red foxes and the dogs, also cats, which can become a direct source of infection to humans. We examined samples of outdoor cat faeces from West Bohemia, where considerable incidence of fox and dog echinococcosis has been reported. Samples of cat faeces were examined by ELISA for specific coproantigens of the *Echinococcus* spp. (CHEKIT – Echinotest, Bommeli, Switzerland). Three out of the total of 80 cat faeces samples were positive (3.75 %). Prevalence *E. multilocularis* in red foxes, dogs and cats ranked the region West Bohemia among hyperendemic localities.

Key words: coproantigens; ELISA; cat; zoonosis; *E. multilocularis*

Introduction

The agent causing echinococcosis in cats is the tapeworm *Echinococcus multilocularis*. This small tapeworm from the Taeniidae family belongs to zoonotic helminths. The typical definitive host in the Czech Republic is the red fox (*Vulpes vulpes*); typical intermediary hosts are small rodents, above all the common vole (*Microtus arvalis*) (Kolařová, 1999). The average prevalence of fox echinococcosis in the Czech Republic ranges between 2.5 % and 12.5 % (Pavlásek, 1998). Dogs (Deplazes *et al.*, 1999) and cats (Deblock *et al.*, 1989) can however become definitive hosts, too, through ingesting infected rodents. It is the way of life providing scope for uncontrolled outdoor movement and predatory tendencies that are of key importance for these hosts to get infected with *E. multilocularis*. A monitoring study undertaken in the Czech Republic has identified echinococcosis in 8.1 % of dogs from wooded regions with an abundance of foxes where the dogs could often spend time outdoor on their own (Svobodová and Lenská,

2002). The prevalence in cats has however been shown to be small despite the fact that their predatory instinct is fully preserved. Experimental infection trials on cats have shown that consumption of larval cysts does not always result in development of sexually mature tapeworms and that the process of development is longer, too (Thompson *et al.*, 2003). In France, the prevalence in cats was 2.41 % (Petavy *et al.*, 2000). Prevalence ranging between 0.4 and 3 % has been reported in Switzerland (Deplazes *et al.*, 1999; Deplazes and Eckert, 2001) and 0.5 to 3.4 % of cats were found positive in Germany (Schantz *et al.*, 1995). The objective of present work was to determine the prevalence of *E. multilocularis* in out door cats in West Bohemia.

Material and Methods

We examined samples of cat faeces in the period of 2002 to 2004. Animals included in the investigation were located on the farms situated in wooded regions in West Bohemia where red foxes live. We investigated only out door cats from villages. Samples of faeces were collected by the owner or a practicing veterinarian and deep-frozen at -20°C. They were stored then at the same temperature till transportation to the laboratory, to be kept there at -70°C till the tests were performed. The cat faeces samples were analyzed by the ELISA method for coproantigens of the *Echinococcus* spp. using a CHEKIT (Echinotest, Bommeli, Switzerland) set (test specificity 95 – 99 %, sensitivity 80 %). The samples were assessed spectrophotometrically and final results were evaluated on computer.

Results

We tested a total of 80 samples of outdoor cat faeces. Coproantigens of the *Echinococcus* spp. were identified in 3

samples (3.75 %) while 77 (96.25 %) samples were negative.

Discussion

We tested a total of 80 samples of outdoor cat faeces. Even though getting faeces of outdoor cats is not a simple task and the number of collected samples was not too high, we mapped a representative population of animals owned by farmers living in selected wooded areas populated by the fox in West Bohemia. Diagnosis of echinococcosis based on detection of coproantigens of the *Echinococcus* spp. allow for confirming the presence of *E. multilocularis* in cats (unlike dogs) because *E. multilocularis* is the only species for which the cat is a potential definitive host. West Bohemia, especially the Klatovy district, is known for hyperendemic incidence of *E. multilocularis*. A trial monitoring prevalence of *E. multilocularis* in the fox in the region has reported 63.3 % of positive animals (Martínek *et al.*, 2001). Ninety six out of 186 dogs tested for echinococcosis in the Czech Republic were from this region, 6.8 % (3 out of 44 dogs) of which were positive in the Klatovy district and 5.8 % (3 out of 52 dogs) in the Sušice district (Svobodová and Lenská, 2002). Coproantigens were identified even in one of 55 anonymous samples (1.8 %) of dog faeces collected in a public area in Klatovy town (Martínek *et al.*, 2001).

This has led us to focus on cats as another potential definitive host. Echinococcosis of outdoor cats inhabiting the same area has been detected in 3.75 % of tested animals, which is also a rather high prevalence. We can highlight that outdoor cats represent a risk of echinococcosis to inhabitants of villages in wooded regions. From the epidemiological point of view, West Bohemia is a region in the Czech Republic characterized by a considerable risk of *E. multilocularis* infection and potential transmission to humans. The only positive case of human alveolar echinococcosis in the Czech Republic has been reported in the same region (Šlais *et al.*, 1979). One important factor allowing for development of alveolar echinococcosis in humans is the immune status. The incidence of the disease in Central Europe ranges between 0.03 and 1.2 cases per 100 000 people per year (Eckert and Deplazes, 1999). Dogs and cats living in contact with people are a statistically significant source of infection to humans (Kern, 2003). The risk of zoonotic transmission can be significantly reduced by regular preventive monthly anthelmintic treatment of dogs

and cats in the endemic areas.

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