

Dicrocoeliosis in Cats and Dogs

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Received August 31, 2005

Accepted March 16, 2006

Abstract

Nesvadba J.: Dicrocoeliosis in Cats and Dogs. Acta Vet. Brno 2006, 75: 289–293.

This paper is the first report of clinical cases of dicrocoeliosis in cats and dogs. In cats, symptoms manifested as inappetence, diarrhoea, loss of weight, changes of hair coat, and, in particular, conjunctivitis with mucoserous discharge and prolapse of the third eyelid. In dogs, clinical symptoms manifested with alteration of the digestive apparatus (anorexia, increased peristalsis, vomiting and diarrhoea), loss of weight, jaundice and skin lesions (pruritus, alopecia and dermatitis interdigitalis). The performance of all working dogs was reduced significantly. Both in dogs and cats, a reliable diagnosis is only possible through repeated coprological examination and demonstration of *Dicrocoelium* eggs. As far as the therapeutic procedures are concerned, albendazole administered for four days was only found fully effective in the cat as well as in the dog, in which praziquantel for 4–5 days was also sufficient.

Dicrocoelium denriticum (lancet fluke), coprology, clinical symptoms, therapy

Dicrocoeliosis is a worldwide trematodosis, which occurs in the individual continents, countries and regions, with very diverse prevalence and intensity. A great number of mammals, mainly the herbivorous, and recently also birds have been reported as hosts (Rommel et al. 2000; Ducháček and Lamka 2003). The distribution of dicrocoeliosis in Switzerland has been described in many papers documenting, in particular, its spread among livestock, and, above all, among cattle and sheep, causing serious losses. These have been permanently checked, not only by the coprological examinations, but also with liver examinations of slaughtered animals (Ducommun and Pfister 1991; Braun et al. 1995; Camara et al. 1996). Dicrocoeliosis may also influence in a negative way the state of health and growth of young horses. During his practise, the author witnessed the death of two foals due to this disease.

Burger (1999) was interested in his dissertation thesis in the occurrence of the dicrocoeliosis in the Emmenthal region. In the years 1991 to 1998 this author examined a total of 2 840 animals, 1 882, 294, 253, 116, 53 and 35 of which were dogs, cattle, cats, sheep, rabbits and goats, respectively. From the total number of examined animals *Dicrocoelium* eggs were found in 11.8% of specimens, i.e., in 59.9%, 32.1%, 31.4%, 25.9%, 23.7%, 2.7% and 1.2% of cattle, rabbits, goats, sheep, horses, dogs and cats, respectively. In dogs and cats Burger (1999) presumed, that these are not cases of natural infection, but a matter of passing *Dicrocoelium* eggs due to eating faeces of infected animals. In cats, it was probably caused by feeding them with food containing *Dicrocoelium* eggs. There is no chapter on dicrocoeliosis in the textbook engaged with the clinical parasitology of the dog and cat by Svobodová and Svoboda (1995). Bowman et al. (2002) recommend praziquantel at the dose of 20 mg·kg⁻¹ of body weight to control flukes in the cat. The same is true of other publications concerning diseases of the cat (Christoph 1977; Kraft and Dürr 1996). Dicrocoeliosis as a disease of the dog is presented only in the publication by Georgi and Georgi (1992). It is also the opinion of these authors that most of the positive findings obtained by coprology in the dog are those of eggs present due to consumption of infected faeces from *Dicrocoelium* infected animals. The above authors also mention the therapy using albendazol at the dose of 15–20

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mg·kg⁻¹ of body weight for dicrocoeliosis in the dogs. The first description of dicrocoeliosis in the cat can be found in the work by this author (Nesvadba 2000). Considering the epidemiology (Wenker 2004), it is remarkable that llamas imported to Switzerland from South American regions, where dicrocoeliosis is not present at all, have become infected with *Dicrocoelium* and suffered from very serious clinical symptoms. Very interesting is the report by Rack et al. (2004) describing dicrocoeliosis in humans including clinical manifestations, course of therapy and reconvalescence.

Materials and Methods

Results of this work are based on data of the examined patients from my veterinary practice in Switzerland in the Emmenthal region, canton Bern. The majority of patients originated from around Zäziwil as well as some larger urban agglomerations, i.e., Bern and Thun, in particular. All the patients were treated on an ambulatory basis. The diagnosis was based on a thorough clinical examination, and when necessary, haematology and biochemistry. The final diagnosis was made by repeated coprological examinations. Flotation solution of the specific weight of 1 300 (a modified method according to Breza) was used for coprology. A total of 11 730 coprological examinations were performed using faeces of different animals in years 1971 through 2004. Samples obtained from cats and dogs amounted to 950 and 7 770, respectively. The intensity of infection was evaluated on the basis of quantitative findings of eggs in the viewing field of the microscope at 100 times magnification and assigned levels 1-5 (level 1 for the sporadic finding, level 2 for 2-5 eggs, level 3 for 5-10 eggs, level 4 for 10-50 eggs and level 5 for the massive finding of eggs).

Results

Dicrocoeliosis in the cat

The first case of dicrocoeliosis in the cat was confirmed in 1980 in a cat from the village Obertal, 850 m above the sea in the Emmenthal region. It was a 14-year-old, short-haired, European cat. The cat was presented with the history of loss of weight and no kittens during the last two years even though previously it had reared two litters every year. On physical examination, the cat was quite cachectic, showing stomach distension, dull hair coat with alopecia and marked icterus. Considering the poor prognosis, the owner elected euthanasia. Autopsy confirmed the clinical finding including the advanced dropsy of the abdominal cavity and jaundice. There was also liver cirrhosis with markedly thickened bile ducts, completely filled with the flukes *Dicrocoelium dendriticum*, which were noticeably smaller than specimens found in the sheep and cattle. In the Obertal village, both in the above farm and others, we have discovered dicrocoeliosis using repeated coprological examinations in the sheep, cattle, goats and horses suspect of clinical diagnosis due to loss of weight, drop in milk production and sterility. In this village and also in the neighbouring ones, we did not discover any other cases of dicrocoeliosis in other cats.

We have been able to undoubtedly prove other cases of apparent dicrocoeliosis, owing to repeated examinations of faeces and specifically aimed treatment, only from July 2000 in 3 cats. They all were brought for the treatment for the same reason as the above-mentioned one. Clinical signs in all 3 patients included mucopurulent conjunctivitis deteriorating in time and leading to the protrusion of the third eyelid. According to their history, there was body weight loss despite good appetite during the last 1 to 2 months. After this period there were apparent problems such as inappetence, recurrent vomiting and diarrhoea. We collected faeces for examination from all three cats. It contained *Dicrocoelium* eggs at 1-3 level intensity. Within 24 and 48 hours of the first coprological examination, control examinations yielding the same numbers of eggs definitely confirmed the diagnosis of dicrocoeliosis. Prior to these coprological examinations, all three cats were treated symptomatically as well as on purpose, regarding other etiological possibilities of the known clinical status, but without any distinct and permanent improvement of the existing disease.

Four days of repeated treatments with praziquantel (DRONCIT inj.), administered s.c. at

the dose of $0.1 \text{ mg} \cdot \text{kg}^{-1}$ of body weight, had no effect. Only application of albendazol in a paste form consisting of 333 mg in 1 ml (ALBAZOL), which was given to the affected cats during four days at the dose of 1 ml per 5 kg of body weight, was fully effective.

The application itself as well as tolerance of this treatment was without any problems. On coprology during the third to fourth day of treatment, *Dicrocoelium* eggs in intensity of 1-2 were still found. The eggs completely vanished in all cats 3 to 4 days after finishing the treatment. We were not able to detect any eggs even after a longer interval of about one month to three years. In a week after finishing the albendazol treatment, the inflammatory changes of conjunctiva began to recede and the protrusion of the third eyelid was diminishing and in 2 cats after 14 days, and in 1 cat after 3 weeks, it disappeared completely. Shortly after the end of treatment as well as 10-14 days later, the appetite of all cats improved. In about a month the nutritional status of the cats returned to normal.

There were other 12 cats in which the clinical manifestation was similar to that in the three cats mentioned above. We were, however, unable to obtain faeces for examination from any of these patients. When the symptomatic treatment, including control of common parasitic infections, remained ineffective and the described clinical status, the changes of the eyes, in particular, persisted, we treated these cats for four days with albendazole and in 9 cases there was a complete cure within the same period as in the three patients with confirmed dicrocoeliosis.

Dicrocoeliosis in dogs

During 34 years of practice in Zäziwil, we were able to find *Dicrocoelium* eggs using coprology in 377 dogs. Different breeds were affected. Most of them were from the closest vicinity of our practice, where the infestation of the main hosts for this parasite (i.e., cattle, sheep, goats, horses, rabbits) was severe. We assumed that, with the known coprophagy of dogs, it is a secondary passage of eggs due to feeding on faeces of infected hosts. It was fully confirmed in 294 dogs because of negative subsequent coprological results. In other dogs, in which excrements for subsequent examinations were not available, the clinical status proved that findings of those eggs could have been associated with the infection of the dogs. At the beginning of 2001 in a short time period, we managed to identify and observe two cases of dicrocoeliosis in the dogs. Other six cases were identified until the end of 2004. The infection of all 8 dogs was confirmed by the first finding of *Dicrocoelium* eggs in the intensity of 1-3 and the subsequent examinations resulting in the same findings.

Five dogs were born and reared in Switzerland, three were imported as puppies from the Czech Republic. Considering the fact that those three dogs were several times examined with negative coprological results right after their import, we may assume that they became infected with *Dicrocoelium* in Switzerland. The clinical manifestation of dicrocoeliosis in all dogs was characterised by alteration of the digestive apparatus. Dogs suffered from changes in the peristalsis, vomiting, diarrhoea, colic states, heavy pains and distinct subicterus. Skin lesions were apparent in four patients (pruritus, eczemas, alopecia, interdigital dermatitis). Half of the clinically sick dogs quickly lost weight, temperament and working performance.

The therapy of dicrocoeliosis was based on our experience with treating cats. Only repeated therapeutic doses of the effective drug can lead to permanent recovery. Albendazole was used in 6 dogs, and praziquantel in 2 dogs. We administered albendazole in a paste containing 333 mg in 1 ml (like in the cats - ALBAZOL). We administered it by oral route at the dose of 1 ml per 5 kg of body weight and day during 4 to 5 consecutive days. For the treatment with praziquantel we used the Drontal plus tablets containing 50 mg of praziquantel + 50 mg of pyrantel + 150 mg of febantel in one tablet. Two tablets per 10 kg of body weight for four days were administered to two dogs. Treatment was started in these dogs soon after the appearance of clinical symptoms and all of them made a full recovery.

Improvements of the overall state of health, not only the physical condition, but the performance as well, were very persuasive. In two dogs suffering from the disease for several months or even two years due to prior unsuccessful symptomatic therapy, recovery could be observed. Since the fourth day after the treatment, they were without any findings of *Dicrocoelium* eggs. The general as well as the nutritional state and the condition of these dogs gradually improved. In these dogs, there remained, however, a tendency to diarrhoea. According to our examinations it was due to giardiosis. Despite the successful treatment of giardiosis using drugs, dietetic and hygienic measures, attacks of diarrhoea recurred.

Discussion

Dicrocoeliosis in the cat and dog has to be considered a rather rare disease (Rommel et al. 2000; Ducháček and Lamka 2003; Georgi and Georgi 1992). In areas of abundant distribution of dicrocoeliosis in the main hosts (i.e., cattle, sheep, goats, horses, rabbits, and wild ungulates) it is necessary to consider the possibility of infection of dogs and cats. Considering dogs kept strictly in the towns, it is necessary to have dicrocoeliosis on the list, when there is a history of even a short-term stay in some infected areas for vacation, for example (Burger 1999; Nesvadba 2000).

Cats and dogs can contract the infection even only through eating grass with an infected ant. It is possible only under circumstances of having free access to the outside of the house. Contrary to dogs that usually gobble the grass beyond control and swallow it fast, cats chew the grass carefully and only then swallow it. It may, therefore, be assumed that tasting an ant leads to spitting the grass more often in the cat than in the dog. Cats are thus infected less frequently (Nesvadba 2000).

Clinical symptoms of dicrocoeliosis in cats and dogs are not specific. In dogs, it is a wide range of digestive disturbances leading to recurrent diarrhoea. In all the infected dogs dicrocoeliosis resulted in disruption of the general state of health, loss of temperament and reduction in the performance of working dogs. It is interesting that the clinical manifestation of dicrocoeliosis in dogs has many common features with the disease in humans (Rack et al. 2004). In cats, the infection caused deterioration of the general state of health and persistent conjunctivitis accompanied by the protrusion of the third eyelid.

In cases of only a passive passage of *Dicrocoelium* eggs, coprology results in finding the lowest levels (level 1) of eggs. Only in exceptional cases in dogs it was the level 2 and once the level 3.

The only option of making a reliable diagnosis is the coprological examination resulting in finding of *Dicrocoelium* eggs. If it cannot be excluded that the examined animal was feeding on faeces of other animals or eventually eating some feed possibly containing the eggs, it is necessary to repeat the coprological examination.

Albendazole was mainly used as the drug of choice with very good results both in the cat and dog. Dogs treated with praziquantel for four days fully recovered as well. The selection of the dose and duration of administration of both compounds was based on the experience with the therapy of dicrocoeliosis in other domestic animal species. Only high doses and their administration for at least four days can lead to full recovery. There is no drug effective after a single dose available on the market. These facts are far more serious, because the treatment of infected animals is the only possibility of eradication of dicrocoeliosis. Any attempts of restriction or liquidation of both intermediate hosts is out of concern for their necessity in maintaining ecological balance of the environment.

Dikrocelióza koček a psů

V práci jsou poprvé v literatuře popsány klinické případy onemocnění dikroceliózou u koček a psů. U koček se příznaky onemocnění projevovaly inapetencí, průjmami, hubnutím, změnou osrstění a zejména zánětem spojivek se serózně-mukózním výtokem a výhřezem

třetího víčka. Rovněž tak u psů se klinické příznaky projevovaly alterací trávicího aparátu (nechutenstvím, zvýšenou peristaltikou, vomitem a průjmy), hubnutím, příznaky ikteru a nápadnými kožními změnami (svěděním, alopecií a meziprstními ekzémy). U všech pracovních psů docházelo k výraznému snížení výkonnosti. Spolehlivé stanovení diagnózy je však jak u koček, tak i u psů možné jedině opakovaným koprologickým vyšetřením a průkazem vajíček dikrocelií. Z ověřovaných léčebných postupů se u koček prokázala plně efektivní pouze 4 dny opakovaná aplikace albendazolu a u psů rovněž 4-5denní kúra albendazolem, případně praziquantelem.

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