
FINDING OF COCCIDIA OF THE GENUS CRYPTOSPORIDIUM IN THE ORGANS OF CALF EXCRETORY SYSTEM

Coccidia of the genus Cryptosporidium have been increasingly dealt with in the literature during the last few years, particularly after the year 1982. New methods of the diagnostics enabled to discover Cryptosporidium in various animal species and man and the host spectrum is still increasing. J. Parasit. 28: 285–307, 1982: Jap. J. Parasit. 28: 285–307 (Current W. L., Long P. L., 1984: J. Infect. Dis. 148: 1108–1112), described the course and characterized individual stages of the life cycle of Cryptosporidium coccidia on the basis of experiments performed with chicken embryos. According to these authors, the ability of autoinfection is ascribed to the oocysts not leaving their host and so they do not differ in their morphology from the oocysts excreted by the experiment in the outer environment, they were designated as "thiaz-watered" oocysts. The evidence of the existence of Cryptosporidium oocysts and the possibility to detect them in the excreta of animals by very simple methods of native preparations using routine microscopy or more complicated staining procedure enabled to work out methods for the isolation and preparation of oocyst suspensions for experimental infection with Cryptosporidium. Several authors of oocysts isolated from different systematically close or distant species revealed a low degree of host specificity in Cryptosporidium. This is an important fact from the view point of both epidemiology and 197

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The literary data show that the life cycle of Cryptosporidium and the localization of these coccidia in the host during the endogenous development have not yet been sufficiently studied and elucidated.

In 1981, one of the co-authors (Pavlášek L., 1984: Folia parasitol. 31: 191–192; 1984b: J. Protozool. 33 A: 194) often found in newborn calves experimentally infected with an isolate of Cryptosporidium oocysts (obtained from a spontaneously infected 15-day-old dead calf) different stages of the parasite not only in the intestine, along its whole length, but also in the epithelium of mucosa of the respiratory system and in mucous and mucus of kidneys, heart and liver.

This paper deals with new results of our studies concerning the localization of cryptosporidia in organs of the excretory system (kidneys, ureters, urinary bladder, with the detection of oocysts in the urine) of spontaneously infected calves. The calves originated from a farm with 100% occurrence of Cryptosporidium infections in newborn calves, frequent diarrheas and fatal diseases of unknown aetiology. Already in 1981, Cryptosporidium was found for the first time in the urine of spontaneously infected calves on days 10–14 after their appearance in the excreta (Pavlášek L., Nikitin V. F., unpublished results). Our last results concern two calves with a heavy diarrheas since the 3rd day of age which could not be treated by any chemotherapy. A large number of C. parvum oocysts were found in their faeces. One of the calves died on day 7 and the other on day 10 after birth. The dissection revealed a sever inflammation of the gastro-intestinal tract at various stages in different parts, and developing pneumonia. The urinary bladder of the 10-day-old calf was filled with 100 ml of turbid gel-like urine of rose colour containing a large amount of phlegm. The urinary bladder of the 7-day-old calf contained 30 ml of yellowish turbid urine also with phlegm. The mucosa of this organ was swollen and hyperemic. Point-like haemorrhages were observed on the surface of bladder mucosa of the other calf. The greatest pathological-anatomical changes occurred in the region of urinary bladder lumen.

The presence of oocysts and different developmental stages of Cryptosporidium parvum was studied in mucous and epithelial cells of ureters, urinary bladders and mucus of kidney sections. The urines, smears and contents of intestines were examined by the method of native preparations and by Giemsa’s method. Cryptosporidium parvum Tjiaiser, 1912, which is considered by Tjiaiser and Current (Upton S. J., Current W. L. 1985: J. Parasit. 5: 423–425) to be a typical bovine species, was found in the epithelium of small and large intestines and caecum at different stages of its endogenous development.

Oocysts of C. parvum were found by us for the first time in the urine and urinary bladder contents. Bovine and developing oocysts were found in the smears and imprints of kidneys of the 10-day-old calf. The epithelium of both calves contained oocysts, and the results confirmed our earlier, still unpublished findings of Cryptosporidium coccidia in the organs of excretory system during examinations of the area of spontaneously infected calves. The urine was taken by a catheter from ileum and during urination from bladder, preventing any contamination with oocysts from the excreta.

Our results provide new important informations about the biology of Cryptosporidium coccidia. They confirm that the coccidia are localized not only in the digestive organs, but also in the respiratory and excretory systems. It is necessary to elucidate the ability of suspens towards the infected animals to all organs with epithelial. It remains unclear whether this affinity to epithelial tissues in different organs, except the digestive system, is generally characteristic of the genus Cryptosporidium or only of certain highly virulent and pathogenous phyla or strains. Also the records of Cryptosporidium in the kidneys and ureters of chickens experimentally infected with an oocyst isolate obtained from a farm with frequent occurrence of Cryptosporidium infections in 35–45-day-old broilers (Pavlášek L., in press) indicate that these coccidia may infect even the excretory organs. The solution of these problems is very important and cannot be successfully made without a thorough knowledge of the health and physiological condition of the host.

The evidence of the presence of Cryptosporidium oocysts in the urine of spontaneously infected calves has a great epidemiological significance, because the infection may be spread in the outer environment with the food, water, litter and other objects contaminated with urines.

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