

GOAT CRYPTOSPORIDIOSIS AND ITS IMPORTANCE AT GOAT PRODUCTION PATHOLOGY

I. Pavlović¹, S. Ivanović¹, M. Žujović², Z. Tomić²

¹Scientific Veterinary Institute of Serbia, Belgrade, Republic of Serbia

²Institute for Animal Husbandry, Belgrade-Zemun, Republic of Serbia

Corresponding author: dr_ivanp@yahoo.com

Original scientific paper

Abstract: Goat cryptosporidiosis is parasitic disease with clinical signs at kids at 4-10 days old. Presence of great number of cryptosporidial oocyst is usually in goats without clinical signs of disease. At goats were established *Cryptosporidium parvum*. Kid cryptosporidiosis had high morbidity and mortality rate. Symptoms of acute cryptosporidiosis include lack of appetite, and weight loss. Clinical signs are yellow diarrhea with odor smell, and some time are present a blood. Animals had abdominal pain, anemia, lost of appetite, dehydration, tenisms, weakens and lost of weight. Occurrence depressive and inactivity. Pathological changes are present in small intestine. In acute cases were thickens gut wall, edema, hyperemia at cecal and colon mucus. There are present numerous hemorrhage, and present of mucofibrinal seam dark brown colored. Those pathological changes drawl resorption and induced clinical signs of disease. Consequence are significant increase of kid accrescence, its weakens and less develop.

Key word: goat, kid, cryptosporidiosis

Introduction

Cryptosporidiosis is a parasitic illness that causes diarrhea caused by *Cryptosporidium* spp., protozoan pathogen of the phylum *Apicomplexa*. A number of *Cryptosporidium* spp. infect mammals: *C. parvum*, *C. hominis* (previously *C. parvum* genotype 1), *C. canis*, *C. felis*, *C. meleagridis*, and *C. muris* (Anderson, 1982; Giles, 2005; Soltane et al., 2007; Quilez et al., 2008). Cryptosporidiosis is typically an acute short-term infection. Cryptosporidiosis parasites are passed in the stool of infected animals and persons. Anyone can get cryptosporidiosis, but persons with weakened immune systems can develop serious, life-threatening illness (El-Sherbini and Mohammad, 2006). *Cryptosporidium* parasites can be found anywhere in the environment that is contaminated by animal droppings or

human waste (Hunter and Thompson, 2005; Brandonisio, 2006). Cryptosporidium oocysts can contaminate soil and the food grown in it. They can get onto objects and surfaces that people touch (Robertson, 2009). They can get into lakes, rivers, streams, and pools where people swim. Sources of disease include parasite-containing stool, food, and water (Giangaspero, 2006; Brandonisio, 2006).

Goat cryptosporidiosis is parasitic disease with clinical signs at kids at 4-10 days old (Giles, 2005). Kid cryptosporidiosis had high morbidity and mortality rate. Symptoms of acute cryptosporidiosis include lack of appetite, and weight loss. Consequence are significant increase of kid accrescence, its weakens and less develop (Foreyt, 1990; Olson et al., 1997).

Aim of our paper is to present a prevalence of cryptosporidial infection in goats in Serbia.

Materials and Methods

Our examination we performed in period 2007-2008. We examined 531 goat and sheep flock (usually breed together) from 23 villages. Total of 1450 faeces samples were examined using routine coprological methods (Šibalić and Cvetković, 1980). The numbers of oocysts per gram (OPG) of faeces were determined by the McMaster technique and identification of oocysts was made on sporulation.

Results and Discussion

During our examination cryptosporidiosis were found at 279 flocks. Kids between five and twenty-one days old are the most susceptible. Once kids become infected, they pass oocysts in their feces in about five days. The primary mode of transmission is by fecal-oral spread. Animals eating fecal-contaminated material (food, water or bedding) can become infected (Noordeen et al., 2001). For example, an infected kid can contaminate the walls and floor with fecal matter. If the next kid coming into the same housing area licks on the contaminated walls, it can become infected (Goyena, 1997). Oocysts are thought to survive for long periods of time outside the animal.

Symptoms of acute cryptosporidiosis include lack of appetite, weight loss, and diarrhea which is usually yellow to yellowish-brown in color and of a creamy texture (Mason et al., 1981). The rapid loss of nutrients and fluids during diarrhea results in severe dehydration. Since intestinal tract cells are disrupted, absorption of feed nutrients is restricted, and the animal loses more nutrients through the digestive tract than it takes in (Mason et al., 1981; Molina et al., 1994; Castro-Hermida, 2005). This also disrupts the kid's immune system and makes it more

susceptible to infection by other bacteria (secondary infection). When body stores of nutrients such as minerals and protein are used up, death quickly follows (Thamsborg *et al.* 1990 a,b; Majewska *et al.* 2000).

Some animals do not develop into chronic cases and become carriers. After infection, animals resist the organism, develop a mild infection that is self limiting, or soon sicken and die (Mason *et al.*, 1981; Thamsbrg *et al.*, 1990a). Some animals may exhibit fevers or signs of respiratory distress, but these may be secondary conditions from opportunistic microorganisms that have infected the animal in its weakened condition (Goyena, 1997; Delafosse *et al.*, 2006).

The extent to which a kid is infected seems to be dependent on its age and immune status. Younger animals are much more susceptible to infection than adults. In studies done with lambs, five-day-old lambs had diarrhea for 9-10 days and suffered from a high rate of mortality. Sixty-day-old lambs showed no symptoms when they were infected and adult sheep completely resisted infection. There is an indication that adults develop immunity to *Cryptosporidium*, yet this immunity does not seem to be passed to their offspring (Koudela *et al.* 1997).

A significant number of drugs have been tested and found ineffective for treating cryptosporidiosis, including most drugs normally used to treat coccidian (Ferre *et al.* 2005). So far, no treatment has been found. The best control of cryptosporidiosis in goats comes from kids getting adequate immunity through colostrum soon after birth. The kid's health is dependent on the amount of antibodies it receives through colostrum. As previously mentioned, sanitation is very important to kid health. Kidding and housing areas must be clean and dry (Bomfim *et al.*, 2005). If kid feeding equipment is not cleaned between feedings, transfer of *Cryptosporidium* to other kids can occur.

Conclusion

Goat cryptosporidiosis is parasitic disease with clinical signs at kids at 4-10 days old. During our examination cryptosporidiosis were found at 279 flocks. Symptoms of acute cryptosporidiosis include lack of appetite, weight loss, and diarrhea which is usually yellow to yellowish-brown in color and of a creamy texture. The rapid loss of nutrients and fluids during diarrhea results in severe dehydration. The organism does not kill the host animal - death occurs due to the severe diarrhea that results. Secondary infections in animals weakened by cryptosporidiosis can also result in death.

Acknowledgment

Research was financed by the Ministry of Science and Technological Development, Republic of Serbia, project BTR 20005.

Kriptosporidioza koza i njen značaj u patologiji kozarske proizvodnje

I. Pavlović, S. Ivanović, M. Žujović, Z. Tomić

Rezime

Kriptosporidioza koza je parazitsko oboljenje uzrokovano sa *Cryptosporidium parvum* koje se klinički javlja samo kod jaradi u starosti 4-10 dana mada se prisustvo velikog broja oocisti često sreće kod koza ali bez klinički manifestnog oboljenja. Kriptosporidioza jaradi karakteriše veliki broj obolelih životinja i znatan mortalitet. Simptomi akutne kriptosporidioze su gubitak apetita i smanjena težina. U kliničkoj slici javlja se žutobraon vodenast proliv sa neprijatnim mirisom, a ponekad je prisutna i krv. Javlja se abdominalni bol, ponekad i anemija, gubitak apetita, dehidratacija, tenismi, slabost i gubitak u težini. Javlja se depresija i inaktivnost. Patološke promene prisutne su u tankim crevima. Kod obolelih jaradi se u akutnim slučajevima javljaju u vidu zadebljanja, edema, hiperemije mukoze cekuma i kolona. Uz to mogu biti prisutne brojne hemoragije i nalaz mukofibrinoznog sloja tamno smeđe boje. Ove patološke promene dovode do otežane resorpcije hranjivih materije i kliničku manifestaciju oboljenja. Kao posledica kriptosporidioze javlja se značajano umanjeno prirasta jaradi, njihova slabija vitalnost i slabije napredovanje.

References

- ANDERSON B.C. (1982): Cryptosporidiosis: A Review. Journal of American Vet Medicine Assn, 180, 1455-1457.
- BOMFIM T.C., HUBER F., GOMES R.S., ALVES L.L. (2005): Natural infection by *Giardia* sp. and *Cryptosporidium* sp. in dairy goats, associated with possible risk factors of the studied properties. Vet Parasitol., 134, 9-13
- BRANDONISIO O. (2006): Waterborne transmission of *Giardia* and *Cryptosporidium*. Parassitologia. 48, 91-94.
- CASTRO-HERMIDA J.A., DELAFOSSE A., PORS I., ARES-MAZÁS E., CHARTIER C. (2005): *Giardia duodenalis* and *Cryptosporidium parvum* infections

in adult goats and their implications for neonatal kids. *Veterinary Record*, 157, 623-627.

DE GRAAF D.C., VANOPDENBOSCH E., ORTEGA-MORA L.M., ABBASSI H., PEETERS J.E. (1999): A review of the importance of cryptosporidiosis in farm animals. *International Journal of Parasitology*, 29, 1269-1287.

DELAFOSSÉ A., CASTRO-HERMIDA J.A., BAUDRY C., ARES-MAZÁS E., CHARTIER C. (2006): Herd-level risk factors for *Cryptosporidium* infection in dairy-goat kids in western France. *Preventive Veterinary Medicine*, 77, 109-121.

EL-SHERBINI G.T., MOHAMMAD K.A. (2006): Zoonotic cryptosporidiosis in man and animal in farms, Giza Governorate, Egypt. *Journal of Egypt Society of Parasitology*, 36, 2, Suppl., 49-58.

FERRE I., BENITO-PEÑA A., GARCÍA U., OSORO K., ORTEGA-MORA L.M. (2005): Effect of different decoquinate treatments on cryptosporidiosis in naturally infected cashmere goat kids. *Veterinary Record*, 157, 261-262.

FOREYT W.J. (1990): Coccidiosis and cryptosporidiosis in sheep and goats. *Veterinary Clinical North American Food and Animal Practice*, 6, 655-670.

GIANGASPERO A. (2006): *Giardia*, *Cryptosporidium* and the spectre of zoonosis: the Italian experience from land to sea. *Parassitologia*, 48, 95-100.

GILES M., CHALMERS R., PRITCHARD G., ELWIN K., MUELLER-DOBLIES D., CLIFTON-HADLEY F. (2005): *Cryptosporidium hominis* in a goat and a sheep in the UK. *Veterinary Record*, 164, 24-25.

GOYENA M., ORTIZ J.M., ALONSO F.D. (1997): Influence of different systems of feeding in the appearance of cryptosporidiosis in goat kids. *Journal of Parasitology*, 83, 1182-1185.

HUNTER P.R., THOMPSON R.C. (2005): The zoonotic transmission of *Giardia* and *Cryptosporidium*. *International Journal of Parasitology*, 35, 1181-1190.

KOUDELA B., JIRÍ V. (1997): Experimental cryptosporidiosis in kids. *Veterinary Parasitology*, 273-281.

MAJEWSKA A.C., WERNER A., SULIMA P., LUTY T. (2000): Prevalence of *Cryptosporidium* in sheep and goats bred on five farms in west-central region of Poland. *Veterinary Parasitology*, 89, 269-275.

MASON R.W., HARTLEY W.J., TILT L. (1981): Intestinal cryptosporidiosis in a kid goat. *Australian Veterinary Journal*, 57, 386-388.

MOLINA J.M., RODRÍGUEZ-PONCE E., FERRER O., GUTIÉRREZ A.C., HERNÁNDEZ S. (1994): Biopathological data of goat kids with cryptosporidiosis. *Veterinary Record*, 135, 67-68.

NOORDEEN F., FAIZAL A.C., RAJAPAKSE R.P., HORADAGODA N.U., ARULKANTHAN A. (2001): Excretion of *Cryptosporidium* oocysts by goats in relation to age and season in the dry zone of Sri Lanka. *Veterinary Parasitology*, 99, 79-85.

-
- OLSON M.E., THORLAKSON C.L., DESELLIERS L., MORCK D.W., MCALLISTER T.A. (1997): Giardia and Cryptosporidium in Canadian farm animals. *Veterinary Parasitology*, 68, 375-381.
- QUÍLEZ J., TORRES E., CHALMERS R.M., HADFIELD S.J., DEL CACHO E., SÁNCHEZ-ACEDO C. (2008): Cryptosporidium genotypes and subtypes in lambs and goat kids in Spain. *Applied Environmental Microbiology*, 74, 6026-6031.
- ROBERTSON L.J. (2009): Giardia and Cryptosporidium infections in sheep and goats: a review of the potential for transmission to humans via environmental contamination. *Epidemiology and Infections*, 137, 913-921.
- SOLTANE R., GUYOT K., DEI-CAS E., AYADI A. (2007): Prevalence of Cryptosporidium spp. (Eucoccidiorida: Cryptosporiidae) in seven species of farm animals in Tunisia. *Parasitology*, 14, 335-338.
- ŠIBALIĆ S., CVETKOVIĆ LJ. (1989): Osnovi dijagnostike parazitskih bolesti, OZID, Beograd
- THAMSBORG S.M., JØRGENSEN R.J., HENRIKSEN S.A. (1990a): Cryptosporidiosis in kids of dairy goats. *Veterinary Record*, 127, 380-381.
- THAMSBORG S.M., JØRGENSEN R.J., HENRIKSEN S.A. (1990b): Cryptosporidiosis in kids of dairy goats. *Veterinary Record*, 127, 627-628.

Received 7 May 2010; accepted for publication 15 June 2010