TOXOPLASMOSIS OF GOATS AND ITS ROLE AND IMPORTANCE IN PATHOLOGY OF GOAT PRODUCTION

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Abstract: Toxoplasmosis is parasitic zoonoses caused by Toxoplasma gondii. Like a goat disease they worldwide distribution and depended of area they had a prevalence 11-96%. infection with T.gondii induced prenatal mortality, abortion, stillbirths and neonatal mortality of kids.

Humans can acquire T. gondii by eating raw or inadequately cooked infected meat and milk of goats, or uncooked foods that have come in contact with infected meat and milk.

Key words: toxoplasmosis, goats, epidemiology, Toxoplasma gondii

Introduction

Toxoplasmosis is zoonoses caused by the protozoan parasite, Toxoplasma gondii (Nicolle&Manceau, 1908). Primary hosts are animals from family Felidae and intermediate host tissues or oocysts of T.gondii persistent at 280 species of mammalian (including man), birds and reptile. The parasite undergoes asexual and sexual cycles in the intestinal epithelium of the cat resulting in the excretion of millions of oocysts in the faeces (Acha and Szyfres, 1996, Tenter et al.2000). The oocysts sporulate in one to five days and are then infective to virtually all species of warm-blooded animals, including sheep, humans and cats. Oocysts may survive in the environment for many months (Buxton, 1991).

Infection with Toxoplasma gondii

When a susceptible animal ingests oocysts on pasture or feed, multiplication occurs in various body organs, especially the brain and muscles and in the placenta of the pregnant animals (Dubey, 1990, Dubey and Adams, 1990, Pavlović and Ivanović, 2002, 2004). After one to two weeks, the host's immune response slows the multiplication of the organism, which then forms tissue cysts. The cysts may remain in the host’s tissues for life. The life cycle of T. gondii is completed when a susceptible cat ingests either tissue cysts or oocysts (Fayer, 1981)

Prevalence and Incidence

Infection with T. gondii is common in goats especially in areas with intensive breeding. Fayer (1981) calculated that the average worldwide prevalence of anti-Toxoplasma antibodies in flocks was age average 31% with a range of 11% to 96%. Toxoplasma infection was responsible for clinical disease in 14% of flocks. All the results were based on flocks experiencing prenatal mortality from which material was submitted to diagnostic laboratories. Therefore, the data are probably an overestimate of the true prevalence.

Pathological importance

Toxoplasma gondii was recognized as a significant cause of abortion of small ruminants in the 1950s (Hartley and Marshall, 1957). Abortions, stillbirths and neonatal mortality occur when susceptible goats are infected during pregnancy (Nurses and Lenghaus, 1986). Infection of the ewe and goats in early gestation leads to death and reabsorption of the fetus and can be mistaken for infertility (Johnston, 1988). Infection in mid-gestation is more likely to cause abortion and birth of weak kids, while infection in late gestation results in the birth of live, infected and immune kids. In the ewe, infection with T. gondii is generally unapparent (Buxton, 1991). Infected goats remain protected for life and, as the disease is not spread laterally, do not present a risk to other animals (Dubey and Beattie, 1988, Dubey, 1990, Dubey and Adams, 1990).

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The most commonly reported effects of toxoplasmosis in goats are abortion, stillbirth and neonatal deaths. (Nirges and Lenghaus, 1986) makes an attempt to estimate the impact of toxoplasmosis on neonatal kid mortality separately from abortions. When the incidence of toxoplasmosis in a flock was above 3%, there were 4% more kids dying at or just after birth. However, other researchers would probably add these deaths at or just after kidding to the number of abortions but often this is not making clear. It is probably better to err on the conservative side and assume that neonatal kid deaths from toxoplasmosis are incorporated in the Toxoplasma abortion rates. Infection of the goats with T. gondii in early gestation may cause death and reabsorption of the fetus and so manifest itself as infertility or barrenness.

Epidemiological importance

T. gondii is transmitted to humans by eating raw or inadequately cooked infected meat, especially poultry, goats, mutton, and wild game, or uncooked foods that have come in contact with infected meat (Jackson et al. 1987, Sacks et al. 1983, Pavlović and Ivanović, 2002, 2004 a). Humans can inadvertently ingest oocysts that cats have passed in their faeces, either from a litter box or from soil (e.g., soil from gardening, on unwashed fruits or vegetables, or in unfiltered water). Women can transmit the infection transplacentally to their unborn fetus (Achaand Szyfres, 1996, Remington, 2001). Vertical transmission of toxoplasmosis from acutely infected pregnant woman can cause serious disease in the fetus. It causes problems if is pregnant woman infected for the first time during pregnancy, when the parasite can cross the placenta and harm the baby. Toxoplasmosis causes the most severe damages of the fetus if a woman comes down with it in her first trimester. Fortunately the odds of contracting toxoplasmosis during pregnancy are low; if you've had it once, you can't catch it again, and it's not often for a woman to be infected for the first time during pregnancy (Alford, 1975, Kapperud et al., 1996).

Diagnostic methods

Today we have several methods to diagnostic T.gondii. Serological detection of antibodies in goat's sera. High level of IgG occurred immediately after infection and they persist several months. Serodiagnostic was importance at fetus because maternal antibody did not pass through placenta and its presence was sign of infection (Blewett, 1983, Arthur and Blewett, 1988, Dubey and Adams, 1990).

Necropsy and pathological changes present reliable signs of toxoplasmosis and use in all suspected cases of infection. Macro pathological changes were most significance at placenta – focal inflammation and necrosis of fetal cotyledon. In fetus we found changes in brain – focal chronically inflammation, unpurulent encephalitis and central calcification. At liver we found focal granulomatosis, at lung necrosis and intestinal miocarditis (Hartley et al.1957)

Finally, goat meat was examined by digestive method to presence of cyst and vegetative form of T.gondii (Pavlović and Ivanović, 2004 b).

Prevention and Therapy

As goats generally acquire infection from oocyst-contaminated feed or pasture, infection rates can be reduced by keeping feed covered to prevent its contamination by cat faeces and cats out of sheep and cattle barns (Blewett, 1983; Blewett and Watson, 1983). Controlling wild cat populations on farms may also help. Farmers may require the assistance of a veterinary diagnostic laboratory to diagnose the cause of an abortion storm in their flocks. This will incur a cost.

Control measures for Toxoplasma abortion in goats include chemo prophylactic treatment of goats during pregnancy with anticoicidals drugs and immunization with a live vaccine or by exposure of susceptible sheep to infection before pregnancy (Buxton, 1991). The risk of infection is also reduced by preventing contamination of goats feed stray cat faeces, keeping cats out of goats’ barns and controlling stray cat populations on farms. Feeding goats continuously during pregnancy with anticoicidals drugs such as monensin and decoquinate.

Treatment of goats with drugs effective against Toxoplasma during an abortion outbreak is not effective at preventing abortions due to the long delay between infection and abortion can significantly suppress a subsequent infection with T. gondii (Buxton, 1991). Monensin-treated ewes given Toxoplasma
oocysts orally produced more live lambs (and produced heavier kids. The drug is not licensed for use in goats and can only be used by a farmer if his veterinary surgeon prescribes it because overdosing with monensin may cause deaths. Decoquinate is an anticoccidial drug licensed for use in sheep and may be used by goats. It is safer and more palatable than monensin but must still be prescribed by a veterinary surgeon if used as an aid in the prevention of toxoplasmosis in pregnant ewes. Drugs such as a combination of sulphamezathine and pyrimethamine have been shown to reduce the severity of an abortion outbreak due to Toxoplasma. However, by the time acute toxoplasmosis is detected in a flock, it is likely to be too late to moderate the course of the outbreak by therapy.

A vaccine using a live attenuated strain (S48) of T. gondii was developed in New Zealand in the 1980s and use to sheep vaccination (O’Connell et al. 1988, Wilkins et al. 1988). The vaccine causes a mild, short-lived infection in the immunized sheep but protects it from clinical disease and chronic infection. It is the most effective means of control currently available for toxoplasmosis in sheep. But, we have no adequate results and no experience to use it in prevention of goats’ toxoplasmosis.

TOKSPLAZMOZA KOZA I NJEN ZNAČAJ U PATOLOGIJI KOZARSKIE PROIZVODNJE

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Rezime

Tokoplasmoza je parazitska zoonoza uzrokovan sa Toxoplasma gondii. Kao bolest koza tokoplasmoza ima globalnu distribuciju koja se u zavisnosti od regiona kreće u procentu od 11-96%. Ne treba posebno naglašavati koliki su ekonomski gubitci u ovčarstvu u zahvaćenim regionima usled pobačaja, rane embrijalne smrti i neonatalnog mortaliteta jaradi (nekoliko sati po rođenju).

Meso i mleko inficiranih ovaca je izvor infekcije narednih prelaznih domaćina uključujući i čoveka ili pravog domaćina.

Kljucne reči: tokoplasmoza, koze, epidemiologija, Toxoplasma gondii

References

1. ACHA,P. I., SZYFRES B. (1989) Zoonoses et maladies transmissible communes e l homme et animaux, OIE, Paris


