Oral Presentation (MP-1)

Cysticercosis in Goats in the Semi-arid Tropics of Timor Island, East Nusa Tenggara, Indonesia

Aji Winarso[1]*, Meriany P.A. Tamonob[1], Victoriano King Dalman Mbula[1], Magdalena Olivia da Santo[1], Emi Liana Malingga[2]

[1]Faculty of Veterinary Medicine, University of Nusa Cendana, Penfui, Kupang City, East Nusa Tenggara
[2]Dinas Pertanian Kota Kupang, Pasir Panjang, Kupang City, East Nusa Tenggara
*Corresponding author's email: ajiwinarso@staf.undana.ac.id

Keywords: baldderworm, cysticercus, Kupang, meat inspection, *Taenia*.

INTRODUCTION

Semi-arid region of West Timor has a good potential of livestock farming, including goat farming. Small scale goat farms in West Timor raise their animals in semi-intensive system by rearing their animals in pasture or rice field.

There are a high demand of goat in the local market especially prior to Kurban Fiest. Despite high population growth of goat, there are some reasons causing low productivity, such as parasite infections.

Taeniid cestodes infect carnivores (as well as human) as the definitive host and involve a wide range of intermediate host where they present as metacestode cyst.[1] Cysticercosis or infection of cestode larval stages (metacestode) may appear vary from subclinical to severe clinical signs.[1] *Cysticercus* infection lead to productivity losses[2] even mortality in livestock.[3] They are responsible for economic losses due to partial or total condemnation of carcass and offal.[1, 3]

Cysticercosis also pose a risk of public health.[3] The zoonosis risk even higher in developing countries and especially in rural area, people lives in close proximity with animals, poor sanitation[3] and low awareness. Dogs and wild canids are common definitive host of the most metacestodes occurring in goat and other ruminants.[1] But some of them involve human as definitive host as well as incidental intermediate host in their life cycle.[4] To make an effective control of cestode infection, it is necessary to identify the agent and collect its epidemiological data.

This research aims to determine the prevalence and to identify the etiological agent of cysticercosis of goats in semi-arid region of West Timor.

MATERIALS AND METHODS

This cross sectional survey was conducted during goats slaughter as sacrificed animals of Kurban fiest at Darul Hijrah Mosque, Kolhua, Kupang City, on August 23, 2018. A total of 44 goats which bought from many parts of greater area of Kupang, West Timor were involved for post mortem examination. Carcass and viscera examined for evidence of larval stage of taeniid cestodes (metacestode/ cysticercus) and the results/findings were then recorded. The performed examination were majorly including to the omentum, mesentery, peritoneal cavity, spleen, lung, and liver.

RESULT AND DISCUSSION

In this research we have got 44 bucks as the samples. There were no female goats being slaughtered. Ante mortem examination confirm that the animals has no clinical signs.

Based on post mortem examination, 3 out of 44 samples were found to be infected by metacestode (6,8%). We find that our estimated prevalence of cysticercosis of goats by *T. hydatigena* are quite lower than its reported prevalence in semi-arid region of Brazil *(*39%; 76/195).[2]

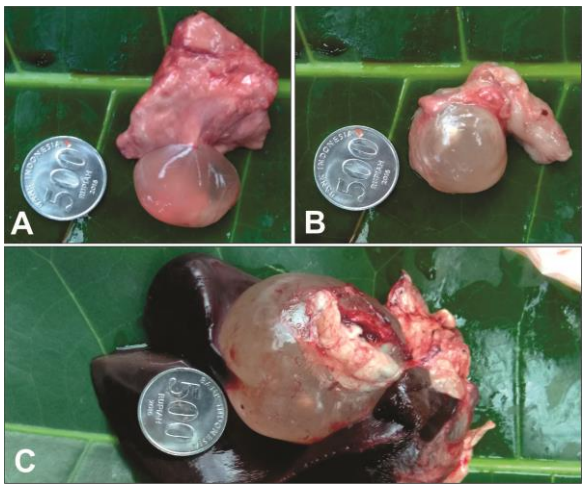

Fig. 1: Cysticerci recovered from goats visceral organs. A: recovered from lung, B: recovered from around trachea, C: recovered from liver surface. (Coin diameter: 27,2 mm)

The cysticerci were found in different location and different size (Figure 1). Cysticerci are

found attached on visceral organs surfaces in the thorax and abdomen cavity.

Taeniid cestodes larval stages may occur in goat are *Taenia hydatigena, T. ovis,* and *Echinococcus granulosus* of canids, and *T. asiatica* of humans (Table 1).[1,4]

Table 1 Metacestode may occur in goats

Species	Properties
T. hydatigena (*C. tenuicollis*)	Large bladder size, thin bladder wall, one proto-scolex, found attached on omentum and mesenteries or liver surfaces[1]
T. ovis (*C. ovis*)	Infect cardiac and skeletal muscle, small size (2-4 mm in diameter)[1]
T. asiatica (C. viscerotropica)	Commonly infect pigs (occasionally in goats), small size (2 mm in diameter), mainly in the pranchyma and on the surface of liver, occasionally found in omentum[1]
E. granulosus (Hydatids cyst)	Thick white bladder wall, contains huge number of scolices[4]

According to site of recovery and morphological identification, the metacestodes were suspected to be *Cysticercus tenuicollis* (*T. hydatigena*). *T. hydatigena* larvae commonly found on the liver or mesenteries, and omentum. It consists a single large bladder (from 1 cm up to 7 cm of diameter)[1] with one protoscolex.[4] In this research we did not find any zoonotic cestode larvae, even *T. asiatica* which is a taeniid tapeworm of human beings in southeast Asia, including Indonesia.[4]

Three bladderworms retrieved from three positive slaughtered animals. The positive infected animals were bearing one cysticercus per animal. *C. tenuicollis* are reported to be more prevalence[3] and showed higher intensity[2] of infection in goats than in sheep's. Subclinical cysticercosis in the positive infected animals was due to the small number of bladderworms. Small number of infection can be tolerated by the host. But massive invasions following huge number of cestode egg ingestion, can lead to acute traumatic hepatitis[4] and mortality.[2] In some case, small numbers of migrating T. hydatigena larvae can be followed by bacterial infection (such as *Clostridium novyi*).[4]

Prevention can be done by giving de-wormer to the definitive host (dog)[3] so cestode eggs shedding could be stopped. Preventing pasture from wild dog should be minded. Morais *et al*.[2] propose that the high rates of infection in reared animals extensively probably are because of longer exposure of contaminated environments, whereas dog as definitive hosts are present.

CONCLUSION

The observed prevalence of cysticercosis of goats in semi-arid West Timor was 6,8%. Recovered metacestodes was suspected to be *Cysticercus tenuicollis* (*Taenia hydatigena* larvae). Further identification (with staining method and microscopy) should be conduct to reveal the scolex morphology.

ACKNOWLEDGEMENTS

The research was conducted during community services held by Dinas Pertanian Kota Kupang in collaboration with Faculty of Veterinary Medicine University of Nusa Cendana and Indonesia Veterinary Medical Association Branch East Nusa Tenggara. We would like to thanks also to Darul Hijrah Mosque (Yayasan Darul Hijrah Madani), Kolhua, Kota Kupang.

REFERENCES

[1] OIE. 2008. Terrestrial Manual: Cysticercosis. Paris: OIE.

[2] Morais DF, Vilela VLR, Feitosa TF, Santos VM, Gouveia VR, Athayde ACR, Azevêdo SS. 2017. Prevalence and risk factors for Cysticercus tenuicollis in goats and sheep in Paraíba, northeastern Brazil. J Braz Vet Parasitol, 26 (2): 235-238.

[3] Miran MB, Kasuku AA, Swai ES (2017) Prevalence of echinococcosis and *Taenia hydatigena* cysticercosis in slaughtered small ruminants at the livestock-wildlife interface areas of Ngorongoro, Tanzania, *Veterinary World,* 10(4): 411-417.

[4] Bowman DD. 2009. Georgis' Parasitology for Veterinarians. 9th ed. St. Louis, Missouri: Saunders Elsevier.