

Emerging Diseases of Goats in Malaysia

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ABSTRACT

Malaysia is aggressively reviving its sluggish small ruminant industry via imports of high and good quality productive goats. However, certain diseases especially the ones which take an insidious course may be missed (rather long incubation period) during quarantine. This paper describes the first definite outbreak of caprine arthritis encephalitis (CAE) and coenuriasis in goats. The disease was confirmed via clinical signs, pathology, and virus isolation (CAE). Further corrective and preventive measures are being discussed.

Keywords: Diseases, goats, caprine arthritis encephalitis (CAE)

INTRODUCTION

The Malaysian government through the Department of Veterinary Services has tirelessly made efforts to revive the sluggish small ruminant industry. However, such impressive tasks are further challenged by diseases with long latency, showing no overt signs or characteristically generating very slow sero-converters (Gendelman *et al.*, 1985). Thus, the authors wish to report two such diseases diagnosed over the last two years at the Faculty of Veterinary Medicine, Universiti Putra Malaysia, Malaysia. Although caprine arthritis encephalitis and cerebral coenuriasis are presented here, the researchers believe that many more emerging or re-emerging diseases may flow into the country and that everyone is geared to combat them.

Since the first reported case (Cork *et al.*, 1974), the original lesions of CAE have extended beyond its name encompassing abnormalities in the udder, lungs, and kidneys. Fortunately,

knowledge on its transmission has led to an effective control and possibly prevention of this particular disease (Narayan and Clemens, 1989). Lamentably, factors which contribute to the onset of clinical signs in infected animals remain unknown. Furthermore, infections with CAE virus are likely to persist in the animal despite a high antibody titer (Gendelman *et al.*, 1985). All breeds, sexes and age can be affected, and owing to its non-lethality, the course can last for several weeks to months.

On the other hand, coenuriasis (gid, staggers, sturdy), a disease which is caused by metacestode (*Coenurus cerebralis*), i.e. the encysted larval stage of the cestode *Taenia multiceps*, may lead to a fatal course (Verster and Tustin, 1982). As for CAE, any breed, sex or age of goats can be affected. However, the clinical signs are dependent on the localisation of the cysts within the brain and spinal cord leading to no characteristic presenting signs (Dyson and

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Linklater, 1979). More commonly, the disease occurs sporadically in one-to two-year old animals, and more occasionally in older animals (Doherty *et al.*, 1989).

MATERIALS AND METHODS

Caprine Arthritis Encephalitis: The farmer of a farm with approximately 2000 heads comprising of Kacang, Jamnapari, and Boer breeds noticed that about 20 of his animals had shown signs of recumbency and/or head tilt (*Fig. 1A*). Four of the goats were brought to UPM for a thorough examination. Out of the four, one was recumbent while the other two showed circling-like gait. In the latter, evidence of head and neck deviation was also noticed. The following day, the recumbent goat was able to be on its feet, while one of the three ataxic goats died. A post-mortem on the dead goat revealed a voluminous lung with beaded consistency without any other striking lesions elsewhere. Histologically, spinal encephalitis (*Fig. 1B*), interstitial pneumonia

(*Fig. 1C*), and cord demyelination (*Fig. 1D*) were seen. Based on the microscopic changes, CAE was suspected and synovial fluid was taken from the remaining goats for virus isolation. The VERO culture yielded cytopathic effects similar to those performed by retrovirus. A year later, one of the three remaining goats showed much more severe signs, including somersault movement, and was euthanized. In addition, lesions of encephalitis, interstitial pneumonia and arthritis were also seen.

Coenuriosis (Gid, staggers, sturdy): This was observed in the four goats which were recently imported from South Africa. The only complaint was that three the goats had abnormal gait, became recumbent and later died. The remaining goat was later sacrificed prior to post-mortem which revealed an abnormally soft brain (*Fig. 2A*) and the presence of two cyst-like structures embedded within the mesenteric fat. Histologically, evidence of encephalitis and the presence of calcereous corpuscle (*Fig. 2B*) were also seen within the spinal cord.

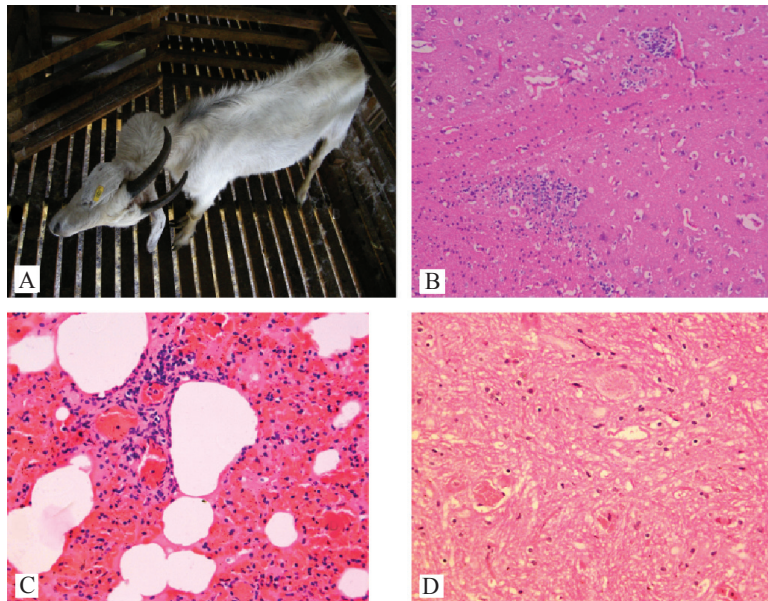


Fig. 1: (A) Severe head tilt in a severely affected buck; (B) Photomicrograph of the brain depicting hypercellularity and foci of lymphocytic aggregation (H&E X 200); (C) Photomicrograph of the lung showing interstitial pneumonia (H&E, X400); (D) Photomicrograph of the spinal cord indicating demyelination and neuronal necrosis (H&E, X400)

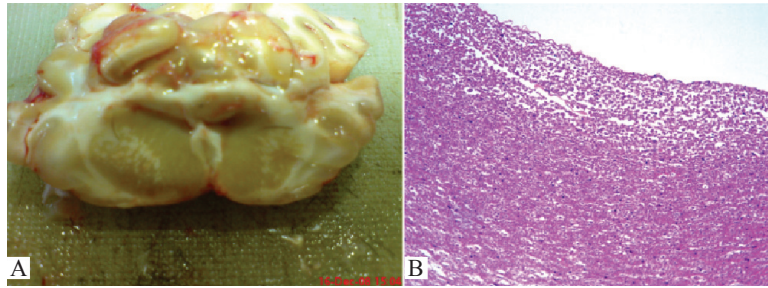


Fig. 2: (A) Photograph of the brain from an affected goat that appeared to be severely softened; (B) Photomicrograph of the spinal cord displaying the presence of calcosus corpuscles (H&E, X400)

RESULTS AND DISCUSSION

Synonymously, one would expect to see either one or both syndromes of arthritis and/or encephalitis in the CAE infection. In the cases reported here, none showed signs of unmitigated arthritis despite harbouring the virus in their joints. Nevertheless, the nature by which infection with the CAE virus escaped one or the other or both syndromes remains a mystery (Rowe and East, 1997). It should be noted that a disease-like CAE endures a tarnishing image to an exporting nation. Although Malaysia (currently) may not supply live goats, the export of *halal* mutton-originated products may suffer a trade embargo. In any way, the confirmed diagnosis of CAE, as reported here, warrants a vigil mechanism in controlling this disease. This includes infringing newly introduced and abating accumulation of new cases. The effectiveness of such programmes requires the cooperation and commitment of all the parties involved. Apart from a judicious clinical examination, various tests may also be used at the point of entry, such as AGID (Anon, 2008). Ironically, the presence of slow sero-converters may allow potential carriers to pass through the check-point “clean” and initiate a new outbreak. At the farm level, any animals showing clinical signs of CAE should be immediately culled. If culling is not economical, all sero-positive animals should be identified and fostering of newly born kids would offer an effective option. All kids should later be tested (i.e. after six months) and sero-

positive individuals should be culled. Likewise, sero-positive animals should be barred from becoming a breeder.

The clinical signs of circling, ataxia, hypermetria, blindness, head tilt, head pressing, paralysis, depression or hyperaesthesia, and stargazing should lead to suspicion of coenurosis. These usually occur sporadically in young and occasionally in older animals (Doherty *et al.*, 1989). In the cases presented in this study, all the four goats were older than 3 years and thus would qualify the cases as being occasional. Information on the location of the cyst, based on direction of circling (Saklia *et al.*, 1987), is meaningless and controversial (Gogoi *et al.*, 1994). Of great epidemiologic or clinical interest is the origin of the infection. If it was from Malaysia, identifying the incriminated dog is therefore an arduous task. Records retrieved from the farm revealed that these goats were in Malaysia for less than 2 months, kept indoors and there were no dogs within the farm. Since the symptoms manifestation of coenurosis is between 2-8 months post-infection, it is likely that the goats were harbouring the infection while they were in South Africa. Although the intradermal gid test maybe used, it should be stressed that it ceded inconsistent and doubtful results (Dyson and Linklater, 1979; Skeritt and Stallbumer, 1984). In this study, the researchers were confronted with the issues of proper disposal of infected carcass to prevent re-establishment of *Taenia multiceps* life cycle which might pose a zoonotic threat.

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