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## A suspected clinical case of caprine arthritis encephalitis (CAE) in a sheep

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### Abstract

Caprine arthritis-encephalitis is primarily a disease of goats caused by a lentivirus which affects the joints and brain of infected animals. Other small ruminants such as sheep are also susceptible to this disease. This case reports describes the clinical appearance of caprine arthritis encephalitis virus infection in a sheep. A 4-year-old ewe was presented to the Universiti Veterinary Hospital, Universiti Putra Malaysia with a history of 7-day long neurological symptoms which include nystagmus, walking in circling with head tilt, unsteady gait and weakness. Blood analysis revealed a macrocytic hypochromic anemia, uremia, and hyperglobinemia. Based on the history, clinical and physical examinations, a tentative diagnosis of clinical case of caprine arthritis encephalitis (CAE) was made. Since the disease is untreatable, the client was advised to cull the animal in order to prevent further spread in the farm.

**Keywords:** Caprine arthritis encephalitis (CAE), neurology signs, nystagmus, unsteady gait, weakness, Sheep

### 1. Introduction

Caprine arthritis encephalitis (CAE) is an economically important disease of dairy goats with worldwide distribution [1-3]. Despite the eradication programmes, the disease is still prevalent in dairy goat populations worldwide causing huge financial losses due to reduced lactation performance and culling. Caprine arthritis encephalitis is caused by CAE-virus (CAE-V) of the genus *lentivirus* which belongs to the family *retroviridae* [4, 5]. The virus typically affects goats of all age, breed and gender [2] and less frequently infects sheep. Infection manifests chiefly as painful arthritis and or encephalomyelitis [3, 6]. Other signs such as synovitis, mastitis and or pneumonia, reduced growth rates have been associated with CAE virus infection [7]. Early symptoms of infection include swelling of joint capsule and lameness. Although infected animals are asymptomatic, and could develop an untreatable lifelong disease syndrome, they can also transmit the virus to their young through colostrum or to herd-mates by direct contact [3]. The main route of transmission of CAE-V is ingestion of CAE-V infected colostrum or milk. Other less efficient routes are prolonged contact with infected goats [8]. Although the current prevalence rate of CAE in Malaysia is unknown, earlier reports states the prevalence rate of CAE at 81 % in the USA [9], 6% in Somalia [10] and 0.8% in sheep in Saudi Arabia [11]. Recently, there was an outbreak of CAE in Japanese goats [12]. To date, there is no known effective treatment for CAE. Control measures usually begin early through feeding heat-inactivated colostrum to kids and lambs. Caprine arthritis encephalitis has been reported in Malaysian goats [13, 14], but to the authors knowledge, there is no any clinical case of CAE in sheep was reported in Malaysia.

### 2. Case Presentation

A 4 year old ewe raised on a semi intensive system of management was presented to the large animal unit of the University Veterinary Hospital, UPM with a main complaint of recumbence and a week-long neurological disturbance. There was no history of deworming or vaccination. Upon physical examination, other symptoms observed include head tilting, circling movements, nystagmus, weakness and an unsteady gait. These same signs were displayed by a

goat in the herd two months earlier. Clinical examination revealed a body condition score of 3/5, while all other parameters were within normal range. Listeriosis, otitis and CAE were among the early diagnoses made. Neurological examination was performed and blood sample was collected for complete blood count and serum biochemistry. The neurological examination revealed absence of pupillary light reflex although other parameters such as menace and palpebral reflexes were normal. The hemogram showed macrocytic hypochromic anaemia, while the serum biochemistry showed evidence of uremia, hyperglobulenemia and an elevated creatinine kinase value (Table 1). Oscopic examination revealed no abnormalities in the ear. Based on the history, clinical sign and laboratory results, a presumptive diagnosis of caprine arthritis-encephalitis was made.

**Table 1:** Blood sample analysis of a sheep suspected of having caprine arthritis-encephalitis.

Parameters	Results	Reference values
<b>Haemogram</b>		
Erythrocytes X1012/L	4.72	9-15
Haemoglobin g/L	60	90-150
PCV L/L	0.21	0.27-0.45
MCV fL	44	28-40
MCHC g/L	286	310-340
Leucocytes X109/L	7.2	4-12
Band Neutrophils X109/L	0.07	0
Seg. Neutrophils X109/L	4.54	0.7-6.0
Lymphocytes X109/L	2.02	2.0-9.0
Monocytes X109/L	0.36	<0.75
Eosinophils X109/L	0.22	<0.75
Basophils X109/L	0	<0.3
Reticulocytes/1000 RBC	0	0
Thrombocytes X109/L	280	250-750
Plasma proteins g/L	56	60-75
<b>Serum biochemistry</b>		
Urea	11.2	2.8-7.1
Creatinine	55	106-168
Total bilirubin	3.3	1.7-6.8
γ-GT	53	30-50
CK	426	100-200
Total protein	57	55-70
Albumin	27	25-35
Globulin	29	25-45

### 3. Treatment

Treatment of CAE in small ruminants is of little value especially when progressive encephalomyelitis and arthritis appear. Affected animals are at best culled as they succumb to secondary infection and ultimately die. Supportive therapy is usually recommended and in this case report, anti-inflammatories Flunixin meglumine (2.2mg/kg) BID and multivitamins, Vitavet® (Nova Laboratories Sdn. Bhd, Malaysia) at 1ml/10kg intra muscularly were administered for five days. Follow up of the case, revealed that the animal responded well to therapy. The client was further advised to avoid milking and consider culling of the suspected CAE sheep. The client was advised to practice strict biosecurity on the farm as this step is crucial to control CAE outbreak in the farm.

### 4. Discussion

Dairy goat farming in Malaysia is still in its early stage but at the same time a fast growing livestock industry. CAE has

been identified as one of many diseases responsible for substantial production losses in dairy goats. This loss is due to reduced milk yield which is caused by indurative mastitis following infection [7, 14]. The status of CAE in small ruminants remains unknown in Malaysia and in other Asian countries. The effect of this disease in dairy production in this region is underestimated. CAE lead to reduced milk production in post-partum animals, which could in turn affect the growth rate and development of the kids and lambs [7].

The diagnostic methods used to arrive at a presumptive diagnosis of CAE in this case report were mainly history, clinical examination and laboratory analysis. These methods can be used to diagnose cases of CAE in goats and sheep since CAE is suspected in small ruminants with lameness/recumbence, arthritis and neurological symptoms [7]. The death of a goat because of CAE in the herd a couple of months earlier further strengthens this diagnosis. To do a confirmatory diagnosis, virus isolation and or antibody detection can be done. Current methods of rapid diagnosis of CAE include quantitative polymerase chain reaction and serological techniques such as antibody detection and agar gel immuno-diffusion [12, 15, 16].

Malaysia is faced with insufficient quality breeding stock and therefore has to rely on importation of goats to meet this shortfall. This is exacerbated by poor animal health and diseases which leads to reduced productivity and low profit margin [17]. Goats are imported from nearby Australia where in the late 1980s and in the early 1990s had widespread cases of CAE [7, 18]. Among other diseases, CAE was found to be responsible for production losses in Australian goats [19]. Recently, two cases of CAE were described in Malaysian goats within the last decade [14, 17]. This case report adds to this number and shows the persistence of CAE in small ruminants in Malaysia. The time and route of entry of CAE-V into Malaysia remains unknown but it could be presumed that either the virus has been present in Malaysian soil for a long time or it was brought into the country through trade animals. To fully determine the impact of this disease on the Malaysian livestock industry, it is desirable that a serological survey be carried out to determine the seroprevalence of CAE and the genotypes of the field strain of this virus. To control this disease in small herds via vaccination in Malaysia is not possible as Malaysia is not practising vaccination against CAE disease. CAE-V free small ruminant's population in Malaysia will contribute to the profitable dairy goat industry.

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