SHORT COMMUNICATION

Clinical Management of Kumri in Goats and the Impact of Antimicrofilarial Therapies on Pregnancy

Sushil Kumar*, Newton Biswas, Sunil Parmar, Kiran Singh

Abstract

This report describes the clinical features, diagnosis, and treatment of 'Microfilariasis (Kumri)' or 'Posterior paralysis' in 17 female goats, including 11 pregnant, over one year. Affected animals showed ataxia, circling, hind limb edema, fever, anorexia, nasal discharge, and skin lesions. Diagnosis was based on clinical signs, eosinophilia, and detection of microfilariae in peripheral blood using the Modified Knott's Test. Among them 8 goats received subcutaneous Ivermectin (0.3 mg/kg) weekly for three weeks and 9 received a single oral dose of Diethylcarbamazine citrate (DEC, 40 mg/kg). Ivermectin led to gradual recovery without adverse effects on pregnancy. DEC produced rapid recovery within 5-7 days but caused pregnancy loss in 33% of treated pregnant goats (2/6). The findings emphasize balancing efficacy and reproductive safety: DEC is fast-acting but risky during pregnancy, while Ivermectin is safer for fetal viability despite a slower response.

Key words: Diethylcarbamazine (DEC), Goat, Ivermectin, Kumri, Microfilaria, Pregnancy.

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Introduction

Cerebrospinal nematodiasis, locally known as *Kumri*, is a major neurological disorder of sheep and goats caused by the aberrant migration of *Setaria* spp. larvae, mainly *S. digitata*, from their natural hosts (cattle and buffaloes) into the central nervous system of aberrant hosts such as goats and sheep (Bordoloi *et al.,* 2019). Transmission occurs through mosquito vectors (*Culex*, *Aedes*, *Anopheles*), and disease outbreaks commonly occur post-monsoon, coinciding with peak vector activity. Large outbreaks have been reported in endemic areas, with morbidity rates reaching 25-30% and mortality up to 15%. Affected animals typically show posterior paresis or paralysis, ataxia, and incoordination, while systemic signs are minimal (Sithara *et al.,* 2023). Diagnosis is supported by haematological findings such as eosinophilia and detection of sheathed microfilariae in blood using Knott's technique (Karki, 2008). Beyond clinical losses, Kumri significantly affects herd productivity through reduced feed intake, reproductive complications, and mortality during peak production periods, leading to substantial economic losses in smallholder systems (Bazargani *et al.,* 2008). Therapeutic management generally involves Diethylcarbamazine citrate (DEC) or Ivermectin, both of which are effective (Hafez *et al.,* 2011; Garcia *et al.,* 2023), but comparative data on their use in pregnant goats are scarce. This case series documents 17 clinical cases of Kumri in goats, emphasizing clinical findings, diagnostic confirmation, treatment response, and reproductive outcomes in pregnant animals.

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Materials and Methods

Over a period of 12 months, 17 female goats were presented to the Division of Animal Reproduction, ICAR-IVRI, Izatnagar (India), with varying degrees of posterior paresis and systemic illness. Of these, 11 goats were confirmed pregnant via transabdominal ultrasonography. The age of the animals ranged from 2 to 5 years. Clinical signs varied in intensity but commonly included: Neurological: ataxic circling, hind limb weakness, posterior paresis/paralysis, Systemic: pyrexia, anorexia, mucopurulent nasal discharge, Dermatological: alopecia, pruritus, and localized skin lesions. In several cases, hind limb edema and recumbency were observed. Disease progression was acute to subacute, with clinical presentation ranging from 2 to 10 days prior to admission. A thorough clinical examination was followed by haematological profiling. Differential diagnoses such as listeriosis, pregnancy

toxemia, and traumatic injuries were ruled out based on clinical history.

Two therapeutic protocols were implemented: 1. Ivermectin (n=8) administered subcutaneously at 0.3 mg/kg body weight, repeated at weekly intervals for three weeks. 2. DEC (n=9) Oral diethylcarbamazine citrate at 40 mg/kg body weight as a single dose. Supportive therapy in both the approach included vitamin B complex, mineral supplementation, and anti-inflammatory agents. All animals were maintained under good hygienic and nutritional management during the treatment period. Pregnant goats were monitored for fetal viability by transabdominal ultrasonography.

Results and Discussion

Complete blood count (CBC) of animals revealed eosinophilia in the majority of cases, suggesting parasitic involvement (Table 1). Peripheral blood samples subjected to the Modified Knott's Test, confirmed the presence of circulating microfilariae in all 17 cases (Fig 1). The morphology was consistent with filarial species commonly implicated in small ruminants in endemic regions.

Table 1: Complete blood count

Different parameters	Mean value (range)	Reference Value
Total RBC (10^6/µL)	5.62 (3.5-9.2)	8-18
Haemoglobin (g/dL)	6.20 (4.5-8.9)	8.8-13.8
P.C.V (%)	20.52 (15.6-25.9)	25-40
Total WBC (10^3/µL)	4.35 (3.3-5.1)	13-15
Neutrophils (%)	33.33 (25.20-42.67)	10-50
Lymhocytes (%)	56.27 (49.22-63.86)	40-75
Monocytes (%)	0.85 (0.75-1.22)	1-5
Eosinophils (%)	9.36 (8.77-11.68)	1-8
Basophils (%)	0.31 (0.29-0.45)	0-3

All eight goats in the ivermectin-treated group exhibited complete clinical recovery following three weekly subcutaneous doses. Neurological signs gradually subsided over the treatment period, and animals regained normal gait and appetite without any observed adverse reactions. Importantly, all five pregnant goats in this group carried their pregnancies to term, and healthy kids were delivered, indicating the safety of ivermectin during gestation.

In contrast, goats treated with diethylcarbamazine citrate (DEC) demonstrated a faster therapeutic response, with clinical improvement evident within 5-7 days of a single oral dose. However, among the six pregnant goats in this group, two experienced abortion within two weeks post-treatment, corresponding to a pregnancy loss rate of 33.3%. Despite this, all surviving animals recovered fully, with resolution of clinical signs and restoration of normal physiological functions. Post-treatment blood examinations confirmed the absence of circulating microfilariae in both groups, and no mortality was recorded during the study period.

The present case series demonstrates that while DEC is superior to ivermectin in terms of rapid clinical recovery, its use in pregnant goats may pose a risk to fetal viability. The pregnancy loss observed may be due to either drug-induced embryotoxicity or systemic stress resulting from rapid microfilarial clearance, which can trigger inflammatory mediators (Garcia *et al.,* 2023). Ivermectin, though requiring a longer treatment duration, was associated with stable gestation and complete recovery, making it a safer choice during pregnancy. Similar observations have been reported in previous studies highlighting ivermectin's safety profile in gestating ruminants (Asquith *et al.,* 1988; Pérez *et al.,* 2008). The Modified Knott's Test proved to be a simple and reliable diagnostic tool in these cases. Early diagnosis and differentiation from other neurological conditions are essential for timely intervention.

In conclusion, microfilariasis (*Kumri*) in goats can be effectively managed with both ivermectin and DEC; however, treatment choice should consider reproductive status. DEC offers rapid therapeutic benefits but may increase the risk of pregnancy loss. Ivermectin remains the safer alternative

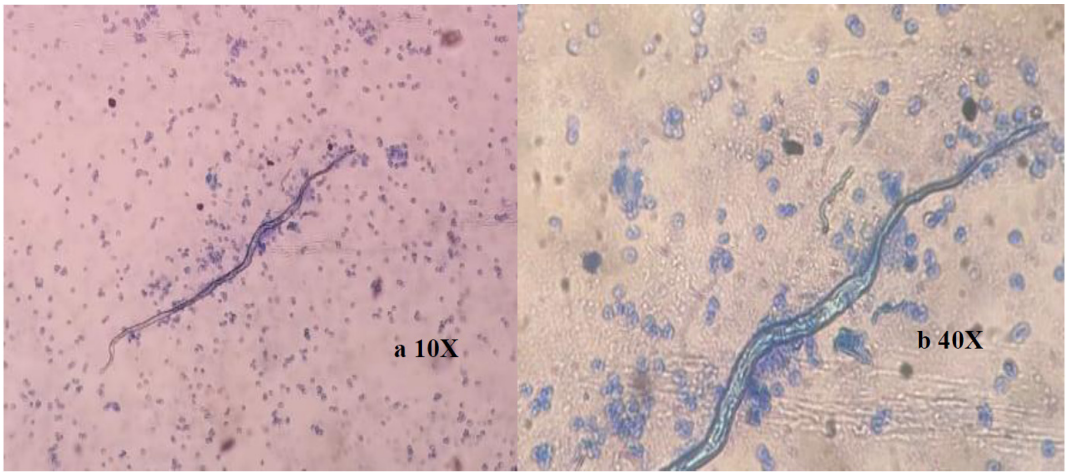

Fig. 1: Blood samples found positive for sheathed microfilaria having average length 2.15 mm (1.8 mm – 2.4 mm) in Modified Knott's test.

for pregnant goats, ensuring favorable therapeutic and reproductive outcomes. Further controlled studies are warranted to optimize treatment protocols for pregnant animals affected by microfilariasis.

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