Diagnosis and Therapeutic Management of Goat Pox in Ovines

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Abstract
An investigation study was undertaken during an outbreak of pox infection in Vembur sheep. Clinical examination revealed fever, accelerated respiration with frequent coughing, papules covered by fluid filled vesicles and nodules were visible in mucous membranes of eye, nostril, mouth, vagina and base of tail. Necrosis and ulceration in mucous membrane of mouth, anus, vagina and in base of tail. Dry scabs were also observed over the oral commissure and nostrils. Samples such as dried scabs and swabs from papules were collected and Goat pox antigen was detected by P32 gene specific PCR-RFLP assay. Infected sheep were isolated and housed away from main stock. To avoid secondary bacterial infection all ailing sheep were treated with Inj. Enrofloxacin, Inj. Meloxicam along with multivitamins and boroglycerine paste applied over mouth lesions for 5 days. No mortality was recorded in the study and all ailing animals recovered completely after 7 days of therapy.

Keywords: Diagnosis; goat pox; management; outbreak; vembur sheep

Introduction
Goat pox virus (GTPV) belongs to the Capri poxvirus genus in the family Poxviridae. The Capri poxvirus genus consists of GTPV, Sheep pox virus (SPPV) and Lumpy skin disease virus (LSDV), whose natural hosts are goats, sheep and cattle, respectively. Capri poxvirus diseases are of transboundary and are on the World Organization for Animal Health Organization (OIE) list of notifiable animal diseases to OIE (WOAH, 2008). Clinical signs of goat pox (caused by GTPV) may be variable, depending on individual host susceptibility or on the virus strain. Skin lesions are most commonly seen and are characterized by macules, papules, nodules, pustules and scabs. The lesions may cover the whole body or may be restricted to hairless or wool-less areas such as face, groin, axilla and perineum. The lesions can also be seen in nose, eye, mammary glands, vulva, prepuce and mouth, making even feed intake painful. In some cases, nodules can also be found in internal organs, particularly the lungs. The majority of fatalities occur during acute phase of disease at time of bronchopneumonia following secondary bacterial infection (Diasso and Viljoen, 2007).

Young animals are mostly affected with a mortality rate varying between 50% and 70%. Most adults, however survive with a mortality rate of approximately 1%. (Garner et al., 2000). In endemic areas, diagnosis of goat pox is easily based on clinical signs. Strains of capri poxvirus do pass between sheep and goats, although most cause more severe clinical disease in only one species; recombination also occurs between these strains, producing a spectrum showing intermediate host preferences and a range of virulence. Some strains are equally pathogenic in both sheep and goats. Sources of the virus include cutaneous lesions, saliva, nasal secretions and faeces (Bhanuprakash et al., 2011).

Goat and sheep farming is an important agri based activities in India and plays a significant role in economy and nutrition of landless, small and marginal farmers. The Vembur sheep is a mutton breed, adapted to semi arid habitat and distributed in and around Thoothukudi, Virudhunagar and Tirunelveli districts of Tamilnadu, India (Chandran et al., 2009). Outbreaks of sheep pox and goat pox occur frequently in India incurring economic losses to sheep and goat industry (Mondal et al., 2004; Bhanuprakash et al., 2006; Roy et al., 2008). The present report describes an outbreak of goat pox,
in sheep that occurred in organised Vembur sheep farm in Tirunelveli.

**History and Clinical Examination**
In February 2015, an outbreak of pox was diagnosed based on clinical signs from an organised farm that housed 120 Vembur sheep in Tirunelveli district. Clinical examination revealed fever, accelerated respiration with frequent coughing, papules covered by fluid-filled vesicles and nodules were visible in mucous membranes of eye, nostril, mouth, vagina and base of tail. Necrosis and ulceration in mucous membrane of mouth, anus, vagina and in base of tail were observed in affected sheep (Fig 1).

![Fig 1: Necrosis and ulceration in mucous membrane of anus, vagina and in base of tail](image)

Dry scabs were also observed over oral commissure and nostrils, which on removal exposed fresh wounds (Fig. 2). The symptoms were noticed mostly in less than 1 year age of sheep. The course of disease lasted for 3 weeks. Clinical symptoms, morbidity and mortality were recorded throughout the course of the disease. The morbidity was 20.9% (14 out of 67 sheep), but there was no mortality.

The aetiology of outbreak was considered as sheep pox initially based on clinical picture and host involved. A previous outbreak of sheep pox had occurred in this farm during 2013. However, it occurred in Kilakaraikal breed of sheep and heavy mortality was reported. In the present outbreak the animals had not been vaccinated for pox infections. The skin scabs and swabs from papules collected from affected sheep were submitted to the Centralised Research Laboratory (CUL), Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), Chennai for confirmatory diagnosis.

**Diagnosis and treatment**
As SPPV and GTPV are antigenically closely related, they cannot be differentiated using serological tests. Hence, P32 gene specific PCR-RFLP was used and Goat pox antigen was detected from samples by P32 gene specific PCR-RFLP. The PCR-RFLP was carried out at CUL, TANUVAS, Chennai. Based on characteristic clinical findings and molecular diagnosis this outbreak was confirmed as goat pox infection. Infected animals were isolated from healthy ones and were housed away from main stock. To avoid secondary bacterial infection all the ailing sheep were treated with Inj. Enrofloxacin (Quintas®) @ 1ml/20 kg b. wt IM, Inj. Meloxicam (Melonex®) @ 2 ml/33 kg b. wt IM, Inj. Tribivel® @ 1ml/animal IM and boroglycerine paste were applied over mouth lesions for 5 days. No mortality was recorded in our study and all ailing animals recovered completely after 7 days of therapy (Fig 3).

**Discussion**
Incidence of goat pox infection in Vembur sheep was investigated in present study. History and clinical findings were highly suggestive of sheep pox virus as the causative agent. But the results of P32 gene specific PCR-RFLP confirmed that outbreak was due to infection with goat pox virus. In present study, the clinical symptoms like papules covered by fluid filled vesicles, nodules, necrosis and ulceration in mucous membrane of mouth, anus, vagina and in base of tail were
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Fig. 3: Marked clinical recovery from mouth lesions observed mostly in less than 1 year age of sheep and also no mortality was recorded. Similar to present study Babliuk et al. (2009) reported sheep have mild clinical disease when infected with GTPV compared to severe disease in goats. Likewise goats may have mild clinical disease when infected with SPPV compared to severe disease in sheep (Bhanuprakash et al., 2006). Moreover, Vembur sheep is a native breed of this region it exhibit some natural immunity as reported earlier by Heine et al. (1999).

Among several methods, P32 gene based PCR-RFLP is simple, specific, cheap and quick to differentiate SPPV and GTPV (Heine et al., 1999, Bhanuprakash et al., 2006, 2010). Similar to present outbreak, there are several reports indicating the SPPV could infect goats and GTPV could infect sheep (Bhanuprakash et al., 2010). The disease is notifiable and there is no specific treatment but broad spectrum antibiotics may reduce losses from secondary bacterial infections (Rao and Bandyopadhyay, 2000). In the present investigation, the ailing animals were treated with broad spectrum antibiotics and all recovered completely after 7 days of therapy. Homologous live attenuated vaccines, which are currently in use in a few parts of the world and under field conditions (Hosamani et al., 2004). This may be due to use of vaccine strain or field virus with unknown host specificity. Because of these reasons, we are in need of differentiating SPPV and GTPV as well as their host specificity in order to select appropriate vaccine candidate.

References


