Severe Inflammatory orf Infection in Fancy Shami Goats in Saudi Arabia

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Abstract:

A flock of fancy shami goats was hit with a very severe orf infection The affected animals showed massive swollen and inflammation of the mouth cavity. The morbidity rate was 86% with no fatality cases among the affected animals. The causative agent was isolated and identified and successful reproduction of the disease on two Ardy goats was obtained. Preventive measures for control of the disease are discussed.

Keywords: Severe orf, shami goats, Saudi Arabia.

Introduction:

Orf or contagious ecthyma is a pox disease of sheep and goats caused by a parapox virus, family poxviridae (Mckeever et al, 1988; Joshi et al, 1996). The disease is world wide distributed and occurs nearly in all countries where sheep and goats are raised (Robinson and Balassu, 1981). Affected animals develop lesions mainly on the skin of the lips progressing from erthyma to papules, pustules and eventually to irregular crusty scabs (Housawi et al, 1993, Zamri-Saad et al, 1993). However, occurrence of the lesions on other parts of the skin was seen on ears (Allworth et al. 1987; Housawi et al. 1991), polls of rams (Reid, 1991), Cornory band, legs, udder and tail (Schmidt and Hardy, 1932, Robinson and Balassu 1981).

Initial site of infection at the skin of the lips is usually induced by sharp objects during feeding (Hawkins, et al. 1991) but udder lesions usually occur as a result of ewes nursing infected lambs (Lewis, 1996).

Various forms of the disease were described from very virulent associated with high mortality (Darbyshire 1961, Mazur and Machado, 1989) to very mild and transient form (Zamri-Saad et al, 1993). The present study reports on a severe form of orf infection in adult shami goats.

Material and Methods

Clinical investigation

In March 1999 a flock of fancy shami goats was struck with severe skin disease in Aloyoune district, north of Al-Hassa in the eastern region of Saudi Arabia. The farm consisted of 110 adult goats, never had not experienced orf infection or contacted orf-infected animals before. In close examination, the sick goats showed lesions limited to the skin around the mouth and buccal cavity. The lesions involved were blisters and variable stages of papules, pustules and ulcerative nodules on the mucosa of hard palte, cheeks, tongue and gums. Scabs were also seen on the lips and lip comissuers. Remarkable inflammation of the entire mucosa of the mouth was noticed and massive swelling of the oral cavity (Fig.1). The mouth breach of the animals was extremely offensive. The body temperature ranged between 40.5-41^{o}C.

Due to the pain and the swelling in the buccal region, the goats had difficulty opening their mouth.

Fig. (1) : Scab Lesions on the margins of the upper and lower lips together with ulcerative nodules on the mucosa of the lower lip, gum and tongue of the naturally-infected shami goat.

Animals

The age of the affected goats was between 2-5 years old, they were of Syrian origin being introduced and bred in Saudi Arabia twenty years ago. They were managed and fed indoors most of the time. However, they are allowed to graze outdoor for three to four hours daily during winter, when grass and weeds are usually available.

Treatment

Soon after examination, orf was suspected. All the affected goats were isolated and given supportive treatment. They were injected intramuscularly with multivitamins (Oligovet Belgium) 1 ml/10 kg body weight and Oxytetracycline (3-5 mg/kg body weight). Each animal was also treated with combined anti-edematous and anti-inflammatory drug, Diurizone (Vetoquinol, France) 2 ml for three consecutive days and locally with Alamycin (NorBook, N. Ireland).

Virus Isolation

Scabs material from affected goats were collected in sterile containers and sent to the laboratory and stored at –86^{o}C. The inoculum was prepared by grinding the scabs to produce 10% suspension in F-12 medium (Sigma), free of serum, pH 7.4. The 10% suspension was spun down by low speed centrifugation (2000 g) for 15 minute and 1000 units of penicillin and 1000 µg of streptomycin were added. The inoculum was then used to infect primary lamb testicle cell culture and later it was passaged onto Vero cell line (Abu Elzain and Housawi, 1997).

Identification of the Isolated Viruses:

The agar gel precipitation test (AGPT) was carried out using 50% suspension of scab material against known anti orf hyperimmune serum as described elsewhere (Housawi et al. 1992).

Micro-serum neutralization test (SNT) was conducted using the isolate and the reference anti orf hyperimmune serum (Abu El-zein and Housawi, 1997).

Experimental Infection of Goats:

Two Ardy goats (aged 6 months) were used for experimental reproduction of the disease. The goats had no previous history of contracting orf disease; they were tested and found to have no anti orf antibodies by SNT as described by Housawi and Abu Elzein, (2000).

Results

Clinical Observation on the Natural Disease:

Despite the severe lesions which included massive swelling of the buccal cavity, blisters formation and the inflammation of the entire mucosa of the hard palates, checks, tongue, gums and presence of lesions or the lip commissiures, no deaths were encountered on the diseased animals. After the fifth day of administration of the treatment, the affected animals began to chew green soft food (Alfalfa) carefully. The body temperature restored to its normal level and the swelling of the buccal cavity was reduced nearly to its ordinary size and shape, but complete recovery and sloughing of the scabs took 37 days.

Result of the Experimental Study:

Typical orf lesions were produced on the two Ardy goats (Fig. 2). The lesions progressed from erythema to papules, pustules and to irregular crusty scabs. All of the lesions were confined to the skin of the mouth and lips. No rise in body temperature was detected. Scabs were later collected and used for viral reisolation and identification. The affected animals completely recovered from the disease 4 to 5 weeks post-infection (Fig.3).

Fig. (2) : Scabs lesions around the mouth of experimentally infected ardy-goat.

Fig. (3) : Complete recovery and sloughing off scabs from experimentally infected ardy-goat.

Virus Isolation

Monolayers of the inoculated primary lamb testicle cells (PLT) showed cell rounding at day 3 post-inoculation, however, complete destruction and removal of the cell sheet was seen on day 5 post-inoculation. Further, two passages were carried out on PLT cells and another two passages were made on Vero cells. Control cells monolayers remained unaffected.

Virus Identification

Strong line of precipitation was seen between the 50% suspension of scab material and the reference anti orf hyperimmune serum. The non-immune serum rabbit did not give a precipitation line.

The infectivity of the isolated virus was completely blocked by the serum anti orf hyperimmune serum in the SNT neutralization test, whereas, the non-immune rabbit serum failed to do so.

Discussion

Orf disease in adult animals is usually benign with recovery between 2-3 weeks (Robinson and Balassu, 1981; Nettleton *et al*. 1996). But the severe or complicated form of the disease is often accompanied by losses in body weight or deaths in affected lambs and kids (Mazur and Machado, 1989;

Zamri-Saad *et al*. 1993). The unusual swollen buccal cavity, inflammation of its entire mucosa and the offensive mouth breath of the shami affected goats in the present study, were evidence for involvement of other complicating factors. Such secondary complications were attributed to bacterial infection (Robinson and Balassu, 1981; Zamri-Saad *et al*. 1993) or due to myiasis (Housawi and Abu Elzein, 2000).

In addition, to physical contact with infective material or affected animal, injury of the tissues of the mouth mucosa or the skin is an essential factor for establishing natural and experimental orf infection (Mckeever *et al,* 1988). In the present study, the development of papules, pustules and ulcerative nodules on the entire mucosa of the buccal cavity indicated that, there were abrasions being established in the mouth tissue, most likely, to be induced during grazing and mastication.

It is well documented that various parts of the world, the type of plants grazed by sheeps and goats may predispose them to orf virus infection. For instance, Hawkins *et al.* (1991) described an unusual outbreak of contagious ecthyma in sheep associated with grazing of the caltrop weed (Tribulus spp.). In the locality where the shami goats, in this study, were kept (Eastern Saudi) three types of weeds are known to grow in the pastures. According to Dr. Y. Hussein (Personal communication) these are *Tribulus terrestries* (caltrop), *Centaurea solstitialis* (Yellow star thistle) and *Xanthum* spp. (*X. italicum* and *X. strumarium*). Since these weeds were proved to have some toxic effects on sheep and goats (Clark *et al.* 1981), this could have some attribution to the aggravated orf conditions in the shami goats in the present study. However, this needs further studies. Another explanation for the extreme severity of the disease on the affected animals in the present study is that, the sero naïve-shami goats could have been exposed to a very virulent orf virus.

Typical orf lesions were established in the experimental two Ardy-goats (Mckeever, *et al*. 1988; Abu Elzein and Housawi, 1997). However, the developed lesions were confined to the skin of the site of infection, around the mouth and lip commissures.

Absence of swelling of the buccal cavity and inflammation of the mucosa of the tongue, hard palets, checks and gums of the experimentally infected goats, proved another evidence supporting the above stated view,

that the severity of the lesions encountered on the shami goats were probably been influenced by the ingestion and mastication of the pasture weeds. However, variation between shami and dwarf Ardy goats breeds, in response to the disease, could not be excluded.

Yearly complaints of the local veterinarians from orf, in and around Al-Hassa region (personal communication) are noted. Since no vaccination is practiced, so far, in Saudi Arabia, farmers are advised to graze their animals on non-weeds pasture. The implementation of vaccination regimen using local orf virus strain is believed to be the best control measure for the disease in the country, along with adoption of the standard hygienic measures.

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إصابة أغنام شامية بإلتهاب الأورف الحاد بالمملكة العربية السعودية

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الملخص:

أصيب قطيع من الأغنام الشامية بمرض الأورف الحاد جداً، حيث ظهرت على الأغنام أعراض سريريه بصوره بثور حول اللثة والشفاة ، كما بدى عليها تورم شديد للفم والتهاب وأحمرار الأغشية المحيطة بتجويف الفم٠

بلغت النسبة المؤية للأتصالات بين القطيع نحو ٨٦٪ ولم تؤدي تلك الإصابات الى حدوث أي نفوق بين الحيوانات المصابة٠

تم عزل الفيروس المسبب للمرض والتعرف عليه وأحداث المرض تجريبياً على عدد أثنين من الأغنام العرضية، كما ناقشت الدراسة الطرق السليمة للسيطرة على المرض في المملكة٠