A FIELD INVESTIGATION ON SPONTANEOUS ABORTION IN AN ORGANISED GOAT FARM IN THANJAVUR DISTRICT OF TAMIL NADU

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Received : 28.04.2015 Accepted : 25.07.2015

ABSTRACT

Goat abortion in a private goat farm near Thanjavur city of Tamil Nadu was investigated in an organised goat farm constituting 78 animalswhich includesmajority of goats and few numbers of sheep.Samples such as serum,nasal swabs, faecal materialand aborted foetal contents were collected at 40 days intervaland sent to the Central University Laboratory of TANUVAS at Chennai for testing. The serum samples were screenedfor antibodies toBrucella spp.,PPRVand Leptospira spp.Nasal swabs were screened for PPRV by counter immune-electrophoresis. Faecal materials were examined for parasitological examination and bacteriological examination more specifically for Johne's disease bacterium. The foetal content was tested for brucellosis by both conventional and molecular methods. Laboratory results showed noantibody presence forBrucella spp.Some samples had antibodies toPPRV, Leptospira spp.(4 Nos.) and some faecal samples hadJohne's disease (3 Nos.) organism by acid fast staining as well as by PCR and after 40 days sampling, 9 Nos. were positive.There was no evidence of internal parasites. The laboratory results and causes of abortion were discussed.

Key words: Goat- abortion-Brucellosis - Leptospirosis- Paratuberculosis - PPRV

INTRODUCTION

Abortions of food producing animals are the cause of considerable economic lossto the farmers. In addition, they may have public health significance, if they are caused by zoonotically important microorganisms. Abortions in goat are more frequently causedbyinfectious agents like Brucella spp.,Leptospira spp., Listeria spp., Coxiella spp., Chlamydia spp., Mycoplasma spp., Toxoplasma spp.,PPRV and non infectious causes such as deficiency of essential nutrients, higher stocking density,poor breeding policy and mechanical injuries. (Kirkbride, 1990).In small ruminants, first pathogen to be suspected in abortion case is Brucella spp. Investigation of abortions is often overlooking other causes like Coxiella spp.,Toxoplasma spp. etc.

However regardless of system of rearing, Leptospira spp. infection is rarely looked as a possible cause for abortion in small ruminants (Menzies,2006). Johne's disease (JD) another neglected infection caused by Mycobacterium aviumsubspecies paratuberculosis,(MAP)as it is one of the most serious infections of farm ruminants worldwide and may usually go unnoticed. Infected goats

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suffer from loss in body weights with (intermittent or continuous) or without diarrhoea, decreased productivity and death. In Tamil Nadu, many intermediate strains of Mycobacteirumavium subsp. paratuberculosis have been isolated and identified by culture and PCR methods (Ronaldet al., 2012). Subsequently excretion of Mycobacteirumavium subsp. paratuberculosis in goat milk was assessed by Ronald et al. (2013).

In this investigation, the cause of abortion wasfoundout by ruling out the causative agentsone by one.

MATERIALS AND METHODS

In a private goat farm at Kadavarayanpatty near Orathanadu in Thanjavur district of Tamil Nadu, abortions in goats were reported. The farm comprises 36 Nos. of Salem black, Tellicherry breed and 20 Nos. of Mecherisheep with 40 cows of Jersey and HF cross bred and 20 calves. The abortion pattern was three abortions in three goats at monthly intervals. During the investigation, no dead animal or foetus was available for sample collection. Blood samples were collected randomly in the population for serum and more specifically from the aborted animals (14 Nos.), nasal swabs (10 Nos.), and faecal swabs / faecal materials (16 Nos.) and 20 Nos. respectively in an interval of 40 daysand JD inactivated vaccine was administered to all young sheep and goat population of age ranging between 1- 2 years. Foetal content / discharge (1 No.) and milk samples (4 Nos.) were also collected in this investigation.

The blood samples were processed to separate the serum aseptically and wereinitially screened for brucella antibodies by Rose Bengal Plate agglutination Test (RBPT) in the lab. The remaining serum samples were sent to Central University Laboratory of TANUVASat Chennai for antibody screening against Leptospiraspp by Microscopic Agglutination Test (MAT) and PPRV by Counter Immuno-Electrophoresis (CIE) methods.The milk samples were also tested for brucella antibodies by Abortus milk ring test. The faecal samples were subjected to helminthic examination. Also the faecal materials were sent to Vaccine Research Centre – Bacterial Vaccine of TANUVAS in Chennai to screen for JD organism byacid fast staining as well as by PCR (Ronald et al., 2012,2013). Nasal swabs were tested PPRV infection by CIE. The aborted foetal content / discharge were used to detect brucella infection by both PCR as well as by conventional isolation method in selective medium.

RESULTS AND DISCUSSION

The serum and milk samples tested by RBPT and Abortus Milk Ring Test did not show the presence of Brucella antibodies respectively and so also by lateral flow test conducted at Central University Laboratory. Aborted foetal contents / discharge were also showed negative results for Brucella spp. by both PCR and bacterial isolation method and hence brucella infection was ruled out. The serum samples screened for PPRV, showed presence of antibodies and was due to vaccination done in few animals in the farm.The nasal swabs were also negative for PPRV antigen,so PPRV infection was also eliminated.

Leptospira antibodies against L.Australis (1:100 in 4 samples and 1:400 in 2 samples)and L.Autumnalis(1:100 in one sample)were present and assessed by MAT. MAT titre of 1:100 is insignificant.The faecal examination for helminths did not show any parasitic eggs, but periodical deworming with Albendazole tablet at the dose rate of 6mg/kg body weight was given orally at 6 months interval. The faecal samples had positive results in both acid fast staining as well as in PCR wherein IS900 gene fragment (277 bp) was amplified for Mycobacterium paratuberculosis organism in goat and sheep samples (Fig. 1 & 2) and the progressive infection was ascertained by the increase in the No. of positive samples collected at 40 days interval. Ikonomopaulouset

al.(2009) also showed the presence of acid fast bacilli in the faecal samples. In 1982, Cara found that Johne'sdisease positive animals had clinical signs like chronic weight loss and intermittent diarrhoea which was absent in the present case. As the farm animals were immunized with Johne's disease killed vaccine to control the Johne's disease, no typical signs were shown (Copra et al., 2000) the positivity of the tests in diagnosis of Mycobacterium paratuberculosisvary upon factors such as clinical stage,animal species,parity,stage of lactation and sample decontamination (Whipple et al., 1991 and Nielsen et al., 2002).

This disease investigation and laboratory results showed that major causes for abortions like PPR,Brucellosis were ruled out.Presence of leptospiral antibodies must be confirmed with paired sera sample.Positive cases of Johne's diseasewarrantedeffectiveimmunization against Johne'sdisease which has been done in this study and periodical surveillance is also required. For the control of Johne's disease, though vaccination against JD reduced loss,it can't be used as a management tool.Vaccination alongwith pasture management,manure management, shed hygiene and good sanitation will considerably reduce losses due to JD in a long run. Moreover JD is most often introduced into a herd by purchasing infected animals and unfortunately these cannot be detected early and hence assessment of risk of infection should be ascertained as they serve as a potential source of infection to the farm.

For control of Leptospirosis,as the quarantine measures were not followed in the newly purchased animals in this farm, it was advised to followa broad based critical management approach including vaccination, antibiotic treatment and environmental conditions to minimise reproductive failures and economic loss.

From the obtained results of the samples collected through disease investigation in a goat farm at Kadavarayanpati, the following recommendations were advocated for future maintenance of livestock.

The faecal examination for helminthes did not show any eggs, but periodical deworming with Albendazole tablet at the dose rate of 6 mg/kg body weight were advocated to be given orally at 6 months interval. The faecal samples screened for Mycobacterium paratuberculosis organism, one goat and a sheep samples had positive results warranted vaccination against this infection and further screening of the faecal samples for this infection from the farm need to be done periodically. The killed Johne's disease vaccine (40 doses) obtained from Vaccine Research Centre-Bacterial Vaccines, Madhavaram was given to 40 animals which includes both kids and adults .To check the status of Johne's disease infection periodical screening will be done by sending to the above laboratory.

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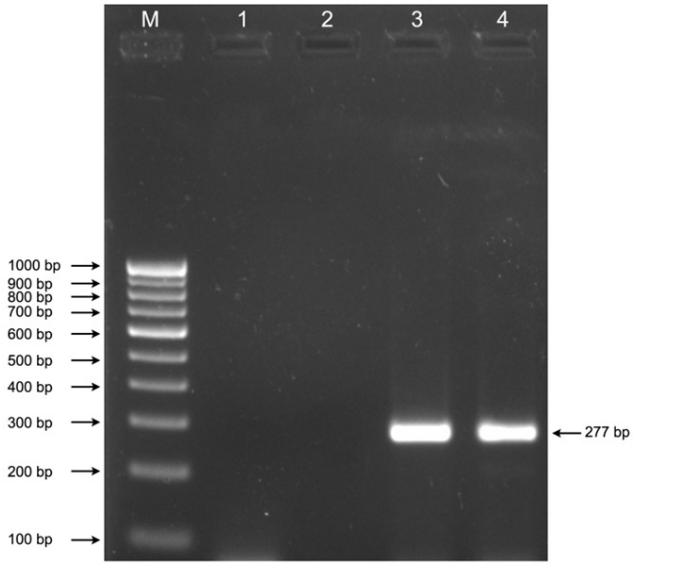

Figure 1. Agarose gel electrophoresis showing 277 bp PCR product (IS gene) of MAP isolate.
M - 100 bp molecular weight marker
Lane 3 and 4 - *Mycobacterium avium* subspp. *paratuberculosis*

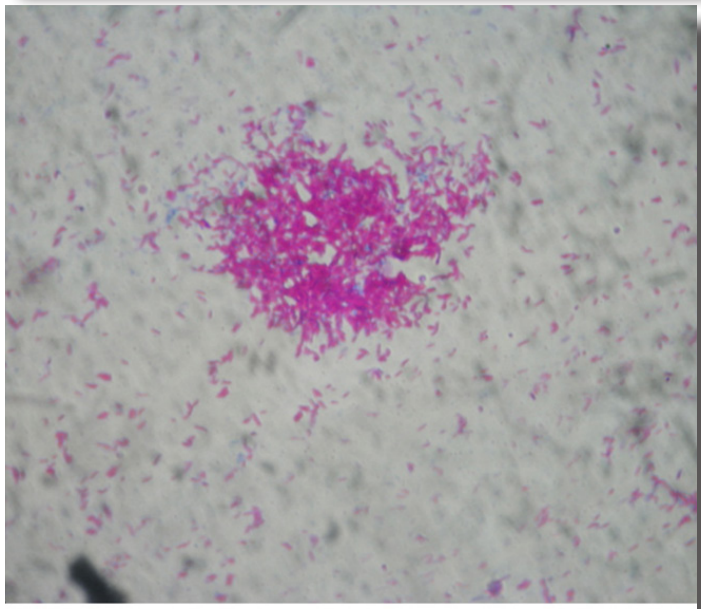

Figure 2. Photomicrograph of MAP isolate under oil immersion