International Journal of Veterinary Sciences and Animal Husbandry

ISSN: 2456-2912
VET 2024; 9(5): 29-31

www.veterinarypaper.com
Received: 03-07-2024
Accepted: 11-08-2024

S Saravanan
Veterinary Assistant Surgeon, Department of Animal Husbandry, Tamil Nadu, India

P Kohila
Assistant Professor, Department of Veterinary and Animal Science, TNAU - ICAR – KVK, Salem, Tamil Nadu, India

P Balachandran
Professor, Department of Veterinary Pathology, VC & RI, Namakkal, TANUVAS, Tamil Nadu, India

M Sasikala
Assistant Professor, Education cell, VC & RI, Namakkal, TANUVAS, Tamil Nadu, India

A Arul Mozhi
Professor, Department of Veterinary Pathology, VC & RI, Namakkal, TANUVAS, Tamil Nadu, India

Suohu Sedeneinuo
Ph.D. Scholar, Department of Veterinary Pathology, VC & RI, Namakkal, Tamil Nadu, India

K Gopal
Assistant Professor, Department of Veterinary Pathology, VC & RI, Namakkal, TANUVAS, Tamil Nadu, India

G Kumar
Assistant Professor, Department of Veterinary and Animal Science, TNAU - VOC AC & RI, Tirunelveli, Tamil Nadu, India

Corresponding Author:
P Kohila
Assistant Professor, Department of Veterinary and Animal Science, TNAU - ICAR – KVK, Salem, Tamil Nadu, India

Mortality pattern and infectious causes of mortality in kids and lambs in Namakkal district of Tamil Nadu

S Saravanan, P Kohila, P Balachandran, M Sasikala, A Arul Mozhi, Suohu Sedeneinuo, K Gopal and G Kumar

DOI: https://doi.org/10.22271/veterinary.2024.v9.i5a.1642

Abstract
A study was conducted to diagnose the infectious etiology and associated pathomorphological changes in kid and lamb diseases. During the study period out of the 609 kids and lambs examined, 107 were affected with various diseases of which 31 were died. The morbidity and mortality rate in kids were 25.4% and 26.6% respectively. In lambs, the morbidity and mortality rate were 12.6% and 31.9% respectively. Samples collected from dead animals were subjected to laboratory examination for isolation and identification of pathogens. Out of 31 samples from dead animals, bacterial pneumonia (87.09%) accounted for major cause of mortality. In the bacterial isolates obtained from lung swab, *Escherichia coli* was detected in highest number of cases (61.29%) followed by *Pasteurella spp.* (16.12%), *Staphylococcus spp.* (9.67%), *Mycoplasma spp.* (6.45%) and Capripox pox virus (3.22%). From the study it was confirmed that *E. coli* was the major cause of bacterial pneumonia causing mortality in kids and lambs.

Keywords: Lamb, kid, disease, pneumonia, *E. coli*, Prevalence

Introduction
In India, goat and sheep farming play a vital role in the economy of small and marginal farmers as well as landless labourers. One of the major problems encountered in goat and sheep farming is higher morbidity and mortality among young ones, which leads to severe economic loss to farmers and entrepreneurs. Although the diseases in kids and lambs depends on many factors like nutrition, immune status of the flock and farm management practices, infectious agents accounts for most cases of kid and lamb diseases. The major causes of mortality in lambs were pneumonia, enteritis, endoparasitic infestations, starvation and septicaemia (Mugerwel *et al.*, 2000) [5]. Colibacillosis is one of the most important diseases that affect the survival of kids. Among the infectious diseases, respiratory disease caused by *Capripoxvirus*, *Pasteurella multocida*, *Peste des petits ruminants virus* (PPRV), *Mycoplasma capricolum capripneumoniae* either alone or in combination affect the productivity of these animals (Dismas *et al.*, 2014 and Settypalli *et al.*, 2016) [2, 7].
Hence, the present work was undertaken to study the prevalence of infectious causes of kid and lamb mortality and to confirm the etiological agents associated with kid and lamb diseases so that effective preventive and treatment measures could be initiated to prevent economic losses in sheep and goat farming.

Materials and Methods
The study was conducted at the Department of Veterinary Pathology, Veterinary College and Research Institute, Namakkal, Tamil Nadu Veterinary and Animal Sciences University. During the study period, a total number of 22 farms (13 goat farms and 9 sheep farms) were investigated with the history of illness and sudden death. A total of 609 kids and lambs were examined including 236 kids and 373 lambs. Detailed post mortem examinations were conducted on 31 dead animals and samples were subjected to laboratory examination. The samples including lung swabs, heart swabs, nasal swabs and faecal swabs were subjected to cultural examination to identify the etiological agents. The bacterial agents were identified based on the colony morphology and staining characteristics.

PCR was employed to rule out *Mycoplasma spp*. and viruses of Orf, Capri pox, Blue tongue and PPR as per standard procedure (Manimaran *et al.*, 2020, Shanmugavadivu *et al.*, 2021) [4, 8]. The data on incidence and mortality pattern was analyzed and interpreted.

Results

In the present study, incidence of diseases pertaining to different age groups, sex, breed and season are presented in Table No. 1 to 3 and Fig.1

Table 1: Age wise incidence of kid and lamb diseases

Age	Mortality Percent		
	Kid	Lamb	Total
0-3 months	22.58 (n=7)	22.58 (n=7)	45.16 (n=14)
3-6 months	29.03 (n=9)	25.80 (n=8)	54.84 (n=17)
Total	n =16	n =15	n = 31

Table 2: Sex wise incidence of kid and lamb disease

Sex	Mortality Percent		
	Kid	Lamb	Total
Male	22.58 (n=7)	29.03(n=9)	51.61(n=16)
Female	29.03 (n=9)	19.35(n=6)	48.39 (n=15)
Total	n = 16	n = 15	n = 31

Table 3: Breed wise incidence of kid and lamb diseases

Breed	Mortality Percent		
	Kid	Lamb	Total
Non-descript	6.45 (n=2)	3.22 (n=1)	9.68 (n=3)
Salem black	41.93(n=13)	-	41.93 (n=13)
Mecheri	-	45.16 (n=14)	45.16 (n=14)
Tellicherry	3.22 (n=1)	-	3.22 (n=1)
Total	n = 16	n = 15	n = 31

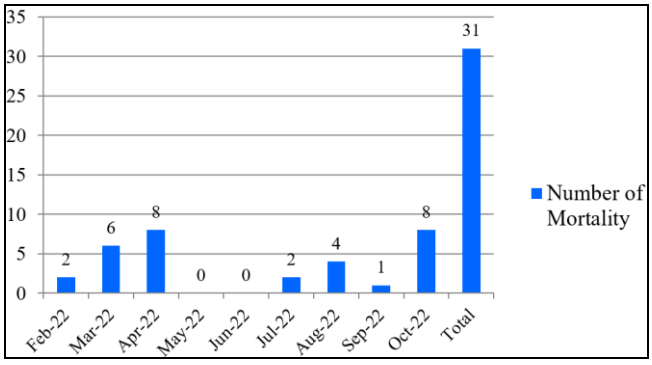


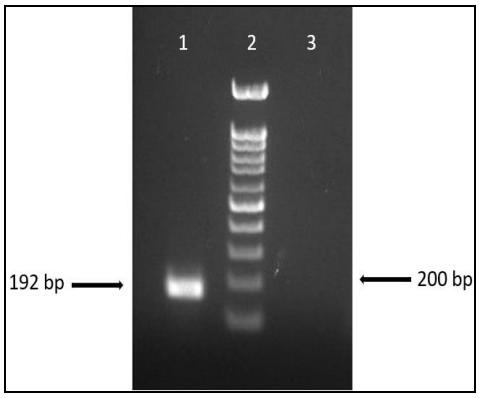
Fig 1: Month wise incidence of kid and lamb diseases

In the present study, a high mortality was observed in the age group of 4 – 6 months (58.06%) in comparison to 0 -3 months age group (41.93%). Mortality in male animals was comparatively higher (51.61%) than in female animals (48.39%) and high mortality was recorded in kids in comparison to lambs. High mortality was observed in Mecheri breed of lambs followed by Salem black kids. During April and October months, high mortality (25.80%) was observed followed by March month (19.35%). No mortality was recorded in the month of May and June during the study period.

Infectious causes of mortality

On analysis of the collected samples, in cultural examination presence of *Escherichia coli* was confirmed by metallic sheen appearance of colonies, appearance of Gram negative bacillary rods and positive indole test. Mannitol salt agar media showed yellow colonies for *Staphylococcus spp*. and in Gram's staining blue coloured organisms observed in bunch of grapes like arrangement. The presence of bipolar organisms in Leishman's stained smears revealed the confirmation of *Pasteurella spp.*

Out of 31 lung samples subjected to PCR to rule out the presence of *Mycoplasma spp.*, and viral agents, two samples were found to be positive with amplification of 316 bp and one sample was found to be positive for capripoxvirus with amplification of 192 bp (Fig.2). All the samples were negative for blue tongue virus, Orf and PPR. From the cultural examination and molecular studies, the mortality due to various diseases and associated etiological agents identified are presented in the Fig.3 and Fig.4.



Lane 1: *Capripox virus* positive
Lane 2: 100 bp ladder
Lane 3: *Capripox virus* negative

Fig 2: Sheep pox virus: 192 bp product on Agarose gel electrophoresis

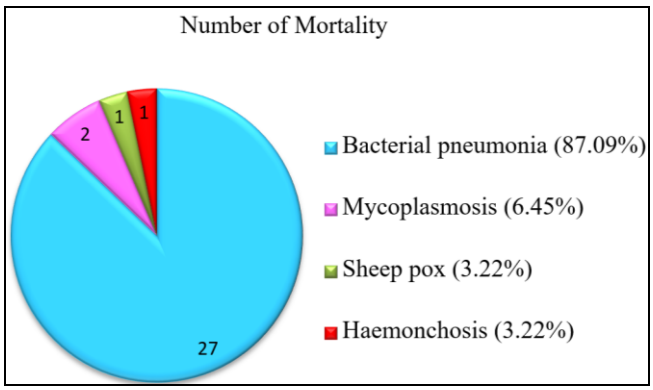


Fig 3: Cause wise incidence of kid and lamb diseases

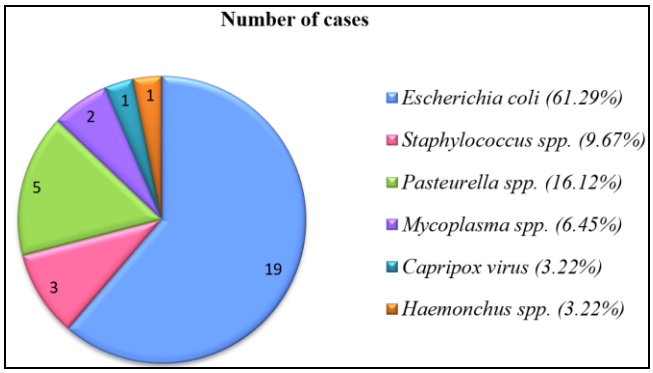


Fig 4: Pathogens isolated from different cases of kid and lamb diseases

From the study it was observed that, bacterial pneumonia caused high mortality (87.09%) followed by mycoplasmosis

(6.45%). Mortality due to sheep pox (3.22%) and haemonchosis (3.22%) were also observed. In bacterial pneumonia, *Escherichia coli* was found in higher number (61.29%) of cases followed by *Pasteurella* spp. (16.12%) and *Staphylococcus* spp. (9.67%).

Discussion

The mortality rate of kids and lambs recorded in the present study were 26.6% and 31.9% respectively and this observation concurs with Dwyer *et al*. (2016) who recorded a mortality rate of 1.4% to 43.5% in young ones. In this study, comparatively more number of kids were affected than lambs and this is due to more farmers are rearing goats rather than sheep in that locality and the same was recorded by Babu *et al.* (2016) [1]. The high mortality rate (54.84%) observed in 3 – 6 months age group in the present study may be due to decrease in maternal immunity in this age group and increased susceptibility of kids to various diseases after weaning. Babu *et al.* (2016) [1] have also observed high mortality rate of 48.86% in the age group of 0 - 6 months. In the present study the mortality rate was slightly higher in males (51.61%) than in females (48.39) and this agrees with the findings of Thiruvenkadan and Karunanithi (2007) [10] who observed a similar mortality rate in male and female young ones. The high mortality rate observed in Mecheri breed followed by Salem black in this study may be due to high population of these breeds in and around Namakkal district. In the present study, high mortality (25.80%) observed during the month of April 2022 and October 2022 concurs with the findings of Thiruvenkadan and Karunanithi (2007) [10] who reported that fluctuations in the climate can cause variations in mortality. The summer stress in the month of April and more rainfall during October would have predisposed the animals for infections, moreover during winter months kids are highly susceptible to respiratory infections.

In the present study, high mortality was recorded due to bacterial pneumonia (87.09%) and among the bacterial agents isolated, *Escherichia coli* accounted for highest incidence (61.29%), followed by *Pasteurella spp.* (16.12%) and *Staphylococcus* spp. (9.67%). Incidence of pneumonia due to *Mycoplasma* spp. was 6.45%. These findings agrees with Babu *et al*. (2016) [1] who also observed higher incidences of *Escherichia coli* (46.51%) compared to *Pasteurella multocida* (9.30%), *Staphylococcus* spp. (9.30%) and *Mycoplasma* spp. (2.32%). Sushma *et al*, 2018 also reported that, the bacteriological studies on different samples collected from lungs and heart blood of kid carcasses revealed the presence of *E. coli* sp. Incidence of *Capripox*virus and *Haemonchus* spp. observed in the present study correlates with the findings of Manimaran *et al*. (2017) [3] and Sabbas *et al*. (2012) [6] who recorded capripox and haemonchosis as cause of mortality in kids and lambs.

Conclusion

This study revealed that bacterial pneumonia was the major cause of mortality in kids and lambs and among the causative organisms for bacterial pneumonia *Escherichia coli* was the major cause of kid and lamb mortality. Hence, efforts should be made for prevention of *E. coli* infection in kids and lambs to prevent untoward mortality and economic losses.

Acknowledgement

The authors are highly thankful to Tamil Nadu Veterinary and Animal Sciences University, Chennai for providing necessary facilities for the above study.

References

1. Babu RSD. Pathomorphological studies of pneumonia in small ruminants. M.V.Sc., thesis approved by TANUVAS, Chennai. c2016.
2. Dismas SNS, Lughano JMK, Sebastian WC, Deogratias S, Faustin PL. Animal health constraints in dairy goats kept under smallholder farming systems in Kongwa and Mvomero Districts, Tanzania. J of Vet. Med. and Ani. Health. 2014;6(11):268-279.
3. Manimaran K, Mahaprabhu R, Jaisree S, Hemalatha S, Ravimurugan T, Pazhanivel N, *et al*. An outbreak of sheep pox in an organized farm of Tamil Nadu, India. Ind. J Ani. Res. 2017;51:162-164.
4. Manimaran K, Balakrishnan S, Sangeetha A, Dhanalakshmi M, Karthik K, Selvaraj J, *et al*. Molecular diagnosis of caprinemycoplasmosis in cauvery delta region of Tamil Nadu. J of Entomol. and Zool. Stu. 2020;8(4):949-953.
5. Mukasa-Mugerwel EA, Lahlou-Kassi, Anindo D, Rege JEO, Tembely S, Tibboand M, *et al*. Between and within breed variation in lamb survival and the risk factors associated with major causes of mortality in indigenous Horro and Menz sheep in Ethiopia. Small Ruminant Res. 2000;37(1-2):1-12.
6. Sabbas A, Sahidou S, Cyprien FB, Oubri BG, Mama AND, Louis JP. Epidemiology of haemonchosis in sheep and goats in Benin. J. of Parasitol. and V. Biol. 2012;4(2):20-24.
7. Settypalli TBK, Lamien CE, Spergser J, Lelenta M, Wade A, Gelaye E, *et al*. One-step multiplex RT-qPCR assay for the detection of peste des petits ruminants virus, *Capripox virus*, *Pasteurella multocida* and *Mycoplasma capricolum* subspecies (ssp.) capripneumoniae. PLoS One. 2016;11(4):1-14.
8. Shanmugavadivu P, Srinivasan P, Arulmozhi A, Sivaraman S, Balasubramaniam GA, Sasikala M, *et al*. Pathomorphology of Concurrent Peste des Petits Ruminants (PPR) and Contagious Caprine Pleuropneumonia (CCPP) in a cross breed goat flock. Indian J. of Ani. Res. 2021;1:6.
9. Sushma V, Nehra B, Jangir L, Sharma V. Aetio-pathological studies of digestive and respiratory affections affecting kids. Int. J Curr. Microbiol. App. Sci. 2018;7(5):180-188.
10. Thiruvenkadan AK, Karunanithi K. Mortality and replacement rate of Tellicherry and its crossbred goats in Tamil Nadu. Indian J. of Animal Sci. 2007;77(7):590-594.

How to Cite This Article
Saravanan S, Kohila P, Balachandran P, Sasikala M, Mozhi AA, Sedeneinuo S, *et al*. Mortality pattern and infectious causes of mortality in kids and lambs in Namakkal district of Tamil Nadu. International Journal of Veterinary Sciences and Animal Husbandry. 2024;9(5):29-31.