SHORT COMMUNICATION

Outbreak of Hemorrhagic Septicemia in Blackbuck (*Antilope cervicapra*) at Sri Sayajibaug Zoo, Vadodara, Gujarat: Clinico-Pathology and Therapeutic Management

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Abstract

Pasteurella multocida causes hemorrhagic septicemia (HS), an acute, often fatal, septicaemic disease in ruminants. It is commonly observed in the world's tropical regions, especially in Asian and African countries. In the present study, eleven blackbucks (*Antilope cervicapra*) were diagnosed positive for hemorrhagic septicemia by using Leishman stain of blood smear showing bipolar organisms. The blackbucks were treated with bolus sulphadimidine @ 5 gm, powder uniselit @ 5 gm and liquid ostovet @ 25 mL per animal/day for seven days and after that bolus sulphadimidine @ 2.5 gm was given for the next three days. Following treatment eight blackbucks recovered and became normal. A post-mortem examination was performed on three blackbucks one died on first day and two blackbucks on the third day, which confirmed the changes typical of HS in lungs, liver and kidneys.

Keyword: Blackbuck, Hemorrhagic Septicemia, Histology.

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Introduction

Blackbuck is the only living member of the genus Antilope, native to India, Nepal, and Pakistan, with some members, also found in the UAE. There are four subspecies of blackbuck recognized, *viz., A. cervicapra* (southeastern blackbuck), *A. c. rajputanae* (Pakistan and north-western blackbuck), *A. c. centralis* (central India), and *A. c. rupicapra* (Nepal and North India). It is the most graceful and beautiful of all the antelopes of Asia (Khalil *et al.,* 2020).

Hemorrhagic Septicemia (HS) is an OIE-listed (list B) disease that causes major economic losses, especially in Asian and African nations, by producing an acute, highly fatal septicemia with high morbidity and mortality. In addition to wild and domestic ruminants, domestic pigs and wild boar are also affected (Cuevas *et al.,* 2020; Kutzer *et al.,* 2021). The disease is caused by *Pasteurella multocida,* a natural inhabitant of the mucosal surfaces of the upper part of the respiratory tract of ruminants, under stressful conditions, such as transport (shipping fever), marketing, change of feed, climate or poor ventilation leading to a brief clinical course that includes severe depression, pyrexia, submandibular edema and dyspnoea, followed by recumbency and it is responsible for above 70% bovine mortality (Rahman *et al.,* 2016). Pasteurellosis has typically been diagnosed using a combination of history, clinical signs, histopathology findings, and the isolation of the pathogenic bacterium. Standard microbiological techniques, particularly biochemical assays, can be used to identify the organism (Anupama *et al.,* 2003). Blood smears and impression smears of organs stained with Leishman's stain can be used to demonstrate the presence of bipolar organisms (Rahman *et al.,* 2016). This communication records an outbreak of HS in Blackbucks of a Municipal Zoo at Vadodara and its clinico-pathological findings and successful therapeutic management.

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Materials and Methods

The present study was conducted at Sri Sayajibaug Zoo, Vadodara, Gujarat. A total of eleven blackbucks (*Antilope cervicapra*) had a history of partial anorexia, lameness in the hindquarter and muscle tremor. The rectal temperature was high (103.0°–104.5°F). They were suspected of having HS and one of them died on very first day. On the third day, all other

blackbucks showed nervine symptoms and were subjected to a detailed clinical examination. Leishman stained blood smear examination was performed to identify the presence of bipolar organisms (Sareen *et al.,* 2018). All ten moribund animals were kept under observation and the treatment was initiated with bolus sulphadimidine @ 5 gm, powder uniselit @ 10 gm and liquid ostovet @ 25 mL per animal/day and was continued for 7-10 days (Sah, 2011). Two blackbucks died on the third day. The tissue samples from the liver, kidney, heart, and lungs were collected during the post-mortem examination of all three animals in 10% formalin for histological examination using Hematoxylin (H) and Eosin (E) staining.

Results and Discussion

The fresh blood smears examined revealed the presence of bipolar organisms in all HS suspected animals (Fig. 1). Hence in the initial phase of the present outbreak, administration of sulfonamides as recommended by Sah (2011) was initiated with bolus sulphadimidine @ 5 gm/animal/day, along with powder uniselit @ 10 gm and liquid ostovet @ 25 mL per animal/day and was continued for 7 days. After that, bolus sulphadimidine @ 2.5 gm/animal/day was given for next three days. Following completion of treatment course, all the seven blackbucks recovered uneventfully and became normal.

The histopathological examination of tissues from dead animals revealed multifocal necrosis and severe fatty changes of the liver (Fig. 2); mild infiltration, cystic dilatation and tubular degeneration of the kidney (Fig. 3); and thickening of alveolar septa, congestion of alveolar blood vessels and emphysema of the lung (Fig. 4 & 5). Khan *et al.* (2011) observed extensive edema and fluid accumulation in the alveoli, emphysema, thickened alveolar septa, congestion, and edema fluid in the bronchioles. They also noticed infiltration of mononuclear cells in the lung tissues and blood

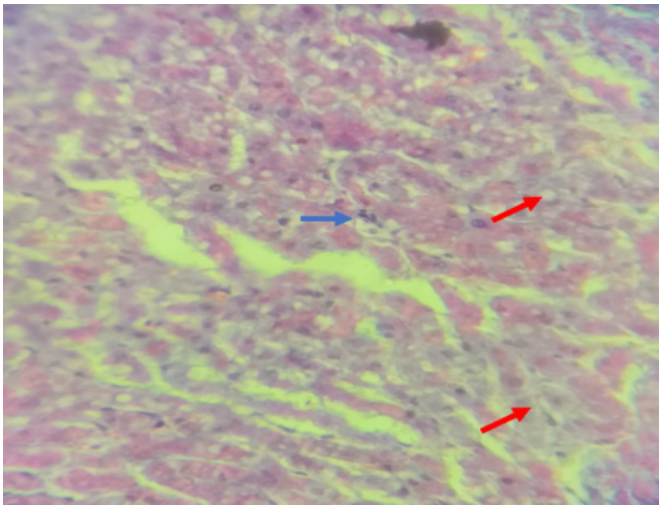

Fig. 2: Liver showing severe fatty changes (Red arrow) and focal haemorrhages (Blue arrow)

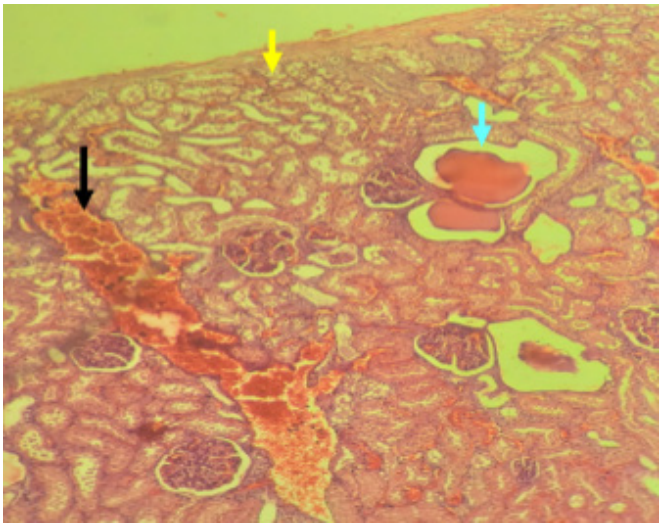

Fig. 3: Kidney section showing haemorrhage and congestion (Black arrow), tubular degeneration (Yellow) and cystic dilatation (Blue arrow)

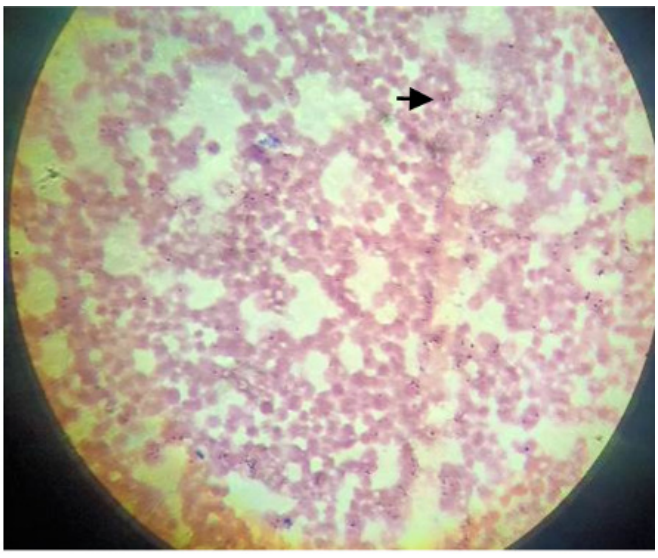

Fig. 1: Bipolar Organisms in blood smear

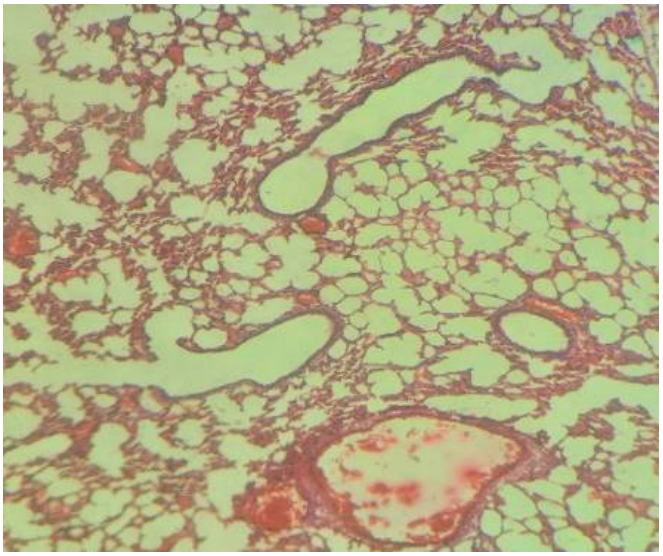

Fig. 4: Sever congestion and haemorrhage in lung

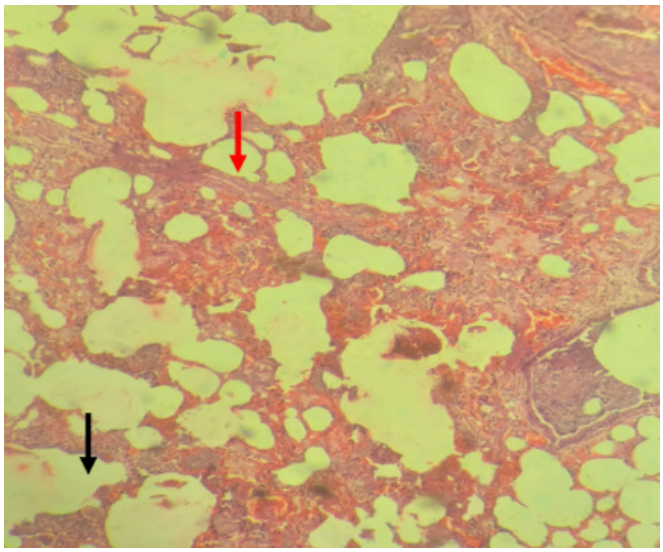

Fig. 5: Lung tissue showing Emphysema (Black arrow) and thickening of alveolar septa (Red arrow)

vessels containing rod-shaped bacteria and variable degrees of degeneration in the kidney. Glomeruli were atrophied and nearly all the renal tubules were studded with casts. Similarly, Wan *et al.* (2018) also reported severe congestion and hemorrhage of multiple tissues with infiltration of the inflammatory cells.

Hemorrhagic septicemia is caused by the gram-negative bacterium *Pasteurella multocida. P. multocida* occurs as four capsular types (A, B, D, and E), and 15 somatic antigens can be recognized on cells stripped of capsular polysaccharides by acid or hyaluronidase treatment. Serotypes B: 2 and E: 2 are two common serotypes of *P.multocida* associated with disease in animals in Asia and Africa, respectively (Khan *et al.,* 2011).

Conclusion

An outbreak of hemorrhagic septicemia (HS) in blackbucks of Sri Sayajibaug Zoo, Vadodara was confirmed using Leishman staining of blood smears of suspected animals and drug sulphadimidine (@ 5 gm/animal/day) along with the supportive therapy gave a positive response to curing the disease. Initiating early and sound treatment helps decrease the severity of the disease HS and reduces the mortality rate among the affected animals.

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