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RESEARCH ARTICLE

A REPORT OF SUPPURATIVE ENCEPHALITIS IN KID

Muthukumar Subramaniyan¹, Thanga Thamil Vanan¹, Meenakshisundaram Subramanian¹, Hemalatha Sentilnayagam² and Samuel Masilamoni Ronald, B^{3*}

¹Department of Livestock Production Management, Madras Veterinary College, Tamil Nadu Veterinary and Animal Sciences University, Chennai, Tamil Nadu, India; ²Department of Veterinary Pathology, Madras Veterinary College, Tamil Nadu Veterinary and Animal Sciences University, Chennai, Tamil Nadu, India; ³Department of Veterinary Microbiology, Madras Veterinary College, Tamil Nadu Veterinary and Animal Sciences University, Chennai, Tamil Nadu, India

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ABSTRACT

A 10 days old female Tellicherry goat kid was presented for necropsy at the Central University Laboratory (CUL), Madhavaram. Detailed necropsy was carried out and suppurative encephalitis was identified as the cause of death. On necropsy, the brain revealed the presence of purulent and foul-smelling exudate in both ventricle of the cerebrum. Histologically, brain revealed severe diffuse degeneration of neutrophils with perivascular edema, neuronal necrosis, and extensive neutrophilic infiltration in the meninges that extended in to the grey matter. Samples collected from the brain revealed the presence of *E. coli* based on biochemical characterization. The losses due to suppurative encephalitis might be attributed to the invasion of *E. coli* bacteria through the nasal route into the circulation resulting in suppurative changes in the brain which was not commonly reported in kids.

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INTRODUCTION

Meningoencephalitis is an inflammation of meninges and the brain. In young goat kid, this central nervous system disease is most commonly recognized as a manifestation of septicaemia (Smith *et al* 2007). Affected kids developed the following neurological disorders characterized by ataxia, head pressing, decreased appetite. Central nervous system (CNS) diseases affecting domestic ruminants comprise conditions that cause economic losses globally, and bacterial infections are important causes of mortality and, also, neurological disturbances of livestock animals (Fecteau *et al*. 1997, Kessell *et al*. 2011, Allen *et al*. 2013). The main inflammatory neurological diseases caused by bacteria in ruminants are: listeriosis, suppurative leptomeningitis and meningioenichelitis, cerebral and spinal cord abscesses, basilar emphyema and neurotuberculosis (Loretti *et al*. 2003, Rissi *et al*. 2010, Camara *et al*. 2014, Konradt *et al*. 2016). CNS may be affected by infectious agents through four paths: hematogeneous or lymphatic dissemination deriving from distant sites (Morin 2004, Stober 2005), direct penetrating lesions; through an adjacent suppurative lesions; or centripetal ascending infection on through peripheral nerves (Barros *et al* 2006, Radostitis *et al* 2007). Suppurative infectious diseases of the central nervous system are important conditions diagnosed in ruminants. *L. monocytogenes* meningoencephalitis was the main neurological

Suppurative leptomeningitis and meningoencephalitis were the conditions of cattle, where *E.coli* was identified as the causative agents in 70.6% of the cases, being related to ascending bacterial infection after caudectomy (Konradt *et al* 2016). In a study on cattle, leptomeningitis and suppurative meningitis was the most frequent neurological disease for the species, and *E.coli* was the main cause of these lesions (Konradt *et al* 2016).

MATERIALS AND METHODS

The kid that died due to brain abscess was dull and depressed, swollen umbilicus, anorectic, head pressing, ataxic with circling gait were observed. Treated for two days and failed to respond to the treatment and found dead. Detailed necropsy was conducted on the dead carcass. Samples were collected and subjected to necessary laboratory investigation procedures to confirm the etiological agent. For bacteriological investigation samples were collected for isolation and identification. The samples collected were streaked and inoculated in specific media (Nutrient agar, blood agar, MacConkey agar and Robertson's cooked meat medium). Suspected colonies were subjected to Gram's staining followed by biochemical tests (Quinn and Carter, 2004). For anerobic bacteria the isolate were confirmed by PCR (Miserez *et al*, 1998). Lactose fermenting colonies were sub cultured on EMB agar. Biochemical test like Catalase, Oxidase and IMViC tests were performed.

RESULTS AND DISCUSSION

Grossly, brain revealed presence of purulent and foul smelling exudates in both the ventricle of the cerebrum (Fig: 1). Pink colour colonies were present in MacConkey agar. Colonies on EMB agar showed Metallic sheen. Grams staining revealed gram negative bacilli confirms *Escherichia coli* as causative organism (Fig: 2). Suspected colonies were positive for Indole, Methyl red and negative for Voges proskauer, Citrate and Oxidase confirms the *Escherichia coli*. Histologically, brain revealed severe diffuse degeneration of neurophils with perivascular oedema, neuronal necrosis, and extensive neutrophilic infiltration (Fig: 3) in the meninges that extended in to the grey matter. Guilherme *et al* 2017 reported suppurative infections of brain in goat after detailed postmortum and histopathological examination.

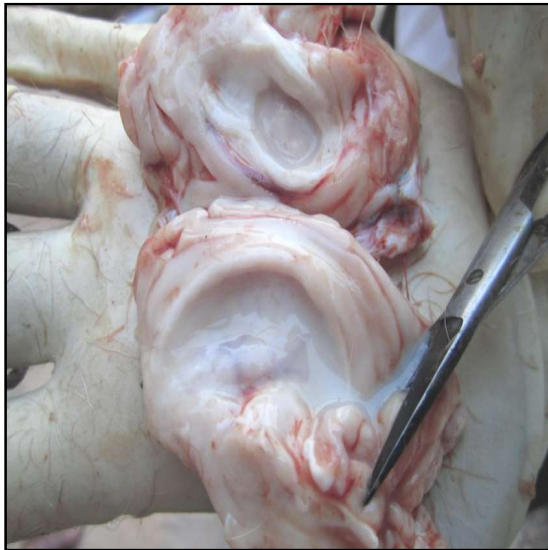


Fig. 1. PM -Gross lesion- Brain- Abscess

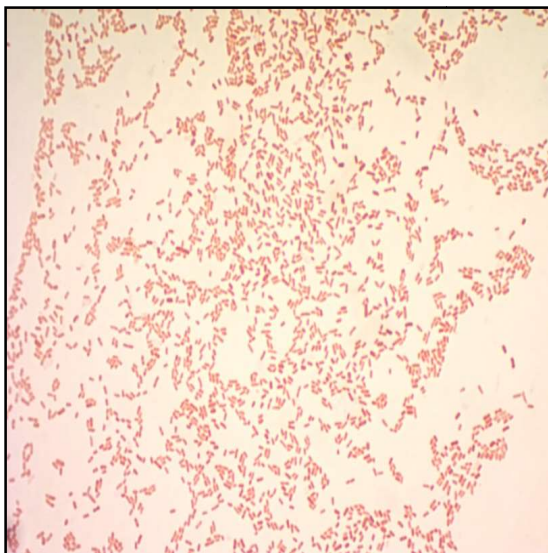


Fig. 2. Gram's staining - Gram-ve bacilli- X 1000x

They also reported that the cattle suppurative leptomeningitis and meningitis is mainly due to *E. coli* infection. Filioussis *et al* 2013 and Yoshimitsu *et al* 2011 documented *E coli* O157:H7 as the possible etiological agents of CNS infections in goats though it is mainly affecting human beings and further, reported and indicated that

toxemia associated with *E coli* O157:H7. As recorded in the present study Kessell *et al* 2011 & Assis-Brasil *et al* 2013 were reported *E.coli* is the main bacteria related to neonatal suppurative meningitis and septicemia. Kessell *et al*, 2011 documented and reported young animals less than one year old are more frequently affected by cerebral abscesses than the adult ruminant which is in concurrence with the present study.

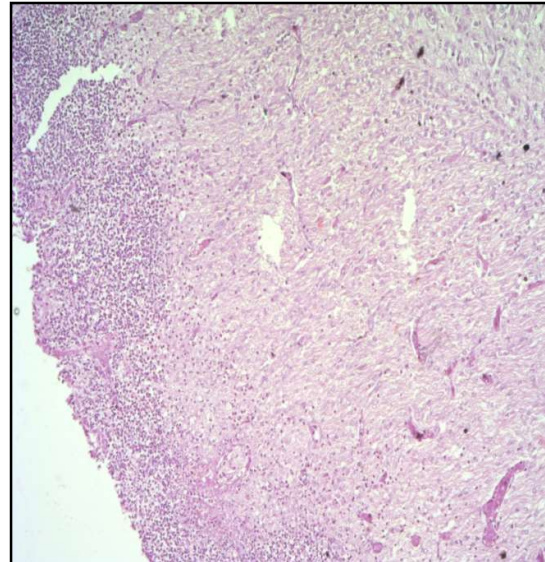


Fig. 3. HP -Brain--Neutrophilic exudate-HEX100x

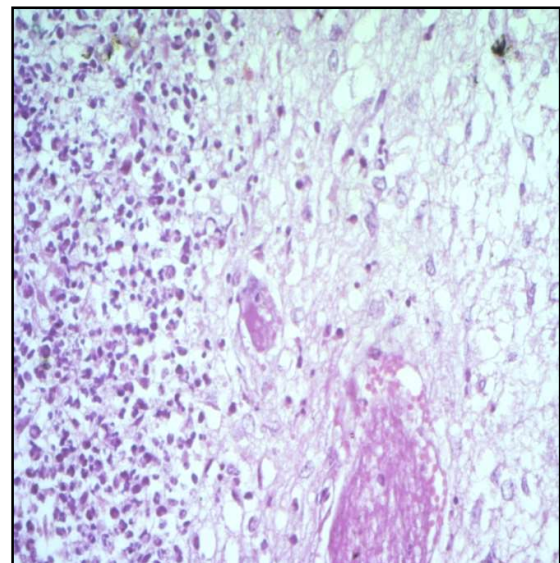


Fig. 4. HP -Brain--Neutrophilic exudate HEX400x

The losses due to suppurative encephalitis might be attributed to invasion of *E. coli* bacteria through naval route into the circulation resulted in suppurative changes in the brain which was not commonly reported in kids. Scanty literature was available in this regards.

CONCLUSION

The present case study reported the *Escherichia coli* infection in a neonatal goat kid which was supposed to got entry through umbilicus. It is very much important to pay extra care to the umbilicus in the younger animals because many a time it is the portal of entry for the microbes in the environment. Sometimes, the oral faecal

much important and vital to ensure kids are getting colostrum intake and the navels are disinfected after birth.

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Ethical issues: Not applicable.

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