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Research Article

CLINICAL AND MICROBIOLOGICAL OBSERVATIONS ON STRANGLES IN DONKEYS

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ABSTRACT

A study was undertaken to determine the occurrence of strangles in 36 donkeys brought to the Clinic of Donkey Health and Welfare Project, Debre Zeit, Ethiopia with the clinical history of guttural pouch emphysema, nasal discharge and submandibular lymphadenopathy. In all, 36 clinical samples (24 nasal swabs and 12 pus samples) collected aseptically from 36 diseased donkeys were investigated microbiologically. *Streptococcus equi* subspecies *equi* could be isolated and identified from six nasal swabs and three pus specimens. It is concluded that strangles is prevalent in donkeys in the study area. The emphasis is being given to make an early diagnosis in order to prevent the quick spread of disease to other susceptible animals. Furthermore, molecular methods need to be used for the detection of S. *equi* from apparently healthy and sick donkeys as a part of regular monitoring.

Key words: Donkey, respiratory problem, strangles, *Streptococcus equi*

Ethiopia is an agricultural based country and livestock plays an important role in the nation's economy. According to the current statistics, there are 7.43 million donkeys in the country (CSA, 2015). The information on the physiology, nutritional requirement, health problem and management system of donkeys is limited. Among equine diseases, strangles is one of the most important bacterial diseases, which affects horses, donkeys and mule. Strangles is caused by *Streptococcus equi* subspecies *equi*, a Gram positive, beta hemolytic organism and has been reported from different countries (Timoney, 1999; Chanter *et al*., 2000; Newton *et al*., 2000; Khoo *et al*., 2011; Erol *et al*., 2012; Senthil *et al*., 2014). It affects animals of all age groups. The morbidity may be up to 100%. About 10% of the affected animals may die from disseminated abscessation or purpura haemorrhagica (Chanter *et al*., 2000). The infection is transmitted through direct contact with nasal discharge or pus from infected donkeys or fomites. Animal to animal transmission involves direct face- to- face contact or exposure to contaminated feed, water, veterinary instruments, grooming kit, beside twitches or bridle bites (Radostits *et al*., 2000). Isolation of the organisms still remains the gold standard for the diagnosis of strangles, though PCR is more sensitive than cultural examination (Sweeney *et al*., 2005). The paucity of information on strangles in equines from Debre Zeit prompted us to record the occurrence of *S. equi* infection in donkeys affected with respiratory problems.

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MATERIALS AND METHODS

The animals belonging to both sex and all age groups with respiratory disorders presented to the Donkey Health and Welfare Project Clinic, Debre Zeit, Ethiopia, were investigated for *S. equi* infection. A total of 36 clinical samples (24 nasal swabs and 12 pus specimens) were collected aseptically in the transport medium from the 36 donkeys after cleaning the site with 70% alcohol and immediately brought to the laboratory for processing. These donkeys were suffering from guttural pouch emphysema, nasal discharge and submandibular lymphadenopathy (Fig. 1). The microbiological examination of nasal swabs and pus was done accordingly to the procedure recommended by Quinn *et al.* (2007). The smears prepared from the nasal swabs and pus were stained with Gram's staining method. The samples were inoculated on blood agar (7% sheep blood) and Mc Conkey's agar, and then the plates were incubated aerobically at 37^0C for 24-48 h. The detailed identification of the organisms was based on various biochemical tests (Quinn *et al*., 2007).

RESULTS AND DISCUSSION

Strangles is a highly contagious disease of equines, which involves the upper respiratory tract. The disease can occur in sporadic as well as in epidemic form involving several animals. Clinical signs and a history of recent exposure to suspect animals may allow presumptive diagnosis of disease. However, the laboratory confirmation is imperative to establish an unequivocal diagnosis of strangles.

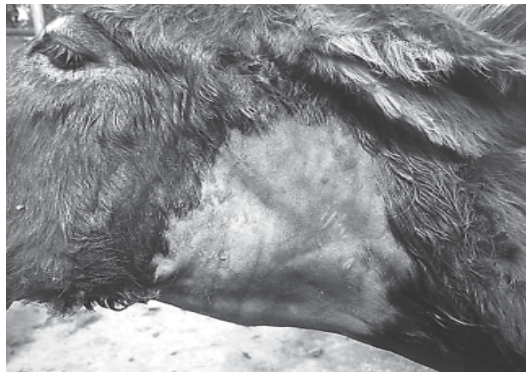

Fig 1. Collection of pus sample from a diseased donkey for isolation of *Streptococcus equi*

The clinical details of the *S. equi* positive animals are presented in Table 1. Of the 36 clinical samples, nine (6 nasal swabs and 3 pus) samples were positive for *S. equi*. Gram's stained smears revealed Gram positive cocci which were arranged in pairs and short chains. Clinical specimens on blood agar showed small, circular, translucent, glistening colonies with beta haemolysis. There was no growth on Mc Conkey's medium. The isolates grew well on Edward medium at 37^0C. The fermentation tests revealed that the isolates were positive for maltose and negative for lactose, sorbitol and trehalose (Table 2). All isolates were also found negative for catalase and oxidase. Based on cultural examination, microscopic morphology and biochemical reaction, all the nine isolates were identified as *S. equi*.

In the present study, the clinical and microbiological findings conclusively proved that nine of the 36 donkeys were suffering from strangles. The isolation of *S. equi* from the nasopharyngeal swabs of horses has also been reported by Senthil *et al.* (2014). These workers also recovered *S. equi* from the apparently healthy horses. Due to lack of PCR facility in our laboratory, we could not process any sample/isolate by PCR. It is possible that by employing PCR, we might have detected more animals positive for *S. equi*. Newton and co-workers (1997) from USA reported that clinically healthy long-term carriers of S. *equi* present a serious risk of spreading strangles, and therefore, repeated nasopharyngeal examination is imperative to detect the carriers. Measures such as immediate isolation of clinically suspected animals, administration of penicillin to the infected and in-contact donkeys, thorough disinfection of the sables and equipments, avoiding overcrowd and mixing of different age groups and prohibition on communal drinking water source were undertaken so as to reduce the incidence of strangles in equine including donkeys. All these measures have been reported to prevent the spread of the disease (Sweeney *et al.,* 2005). Further studies on epidemiology of strangles in donkeys are needed in this region.

This study thus revealed the presence of *S. equi* in donkeys in Ethiopia. In the absence of PCR, repeated culture of the nasopharyngeal swabs can be useful to detect the asymptomatic carriers of *S. equi* following outbreaks of strangles.

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Table 1
Clinical details of the *Steptococcus equi* positive donkeys

Region	Sex	Age in years	Type of sample	Number of samples	Symptoms
Kality	M	2-5	Swab	2	Guttural pouch emphysema
	F	5-10	Pus	1	Submandibular lymph node inflammation
Kata	M	2-5	Swab	1	Nasal discharge
		10-15	Swab	1	Nasal discharge
	F	2-5	Pus	1	Inflammation of submandibular lymph node
Garbicha	M	2-5	Swab	1	Nasal discharge
	F	2-5	Pus	1	Nasal discharge
Ganda gorba	M	2-5	Swab	1	Nasal discharge

Table 2
Biochemical tests of *Streptococcus equi* isolates obtained from nine donkeys

Number examined	Number positive	Hemolytic character on blood agar	Fermentation test (in phenol red)			
			Maltose	Trehalose	Sorbitol	Lactose
Nasal swabs (24)	6	Beta hemolysis	+	–	–	–
Pus (12)	3	Beta hemolysis	+	+	–	–

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