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Pneumonia in Goats in Sudan

Hanan Mohamed Elsheikh and Salaheddin Omer Hassan
Port Sudan-Veterinary Research Laboratory, Sudan

Abstract: This study aimed to determine the etiology of bacterial pneumonia in goats. Of 200 pneumonic lesions, 51% (102/200) yielded different bacterial isolates. *Mannheimia* (*Pasteurella*) *haemolytica* was predominant isolates (83.3%; 85/102), followed by *Corynebacterium pseudotuberculosis* (6.9%; 7/102) and α-haemolytic *Streptococci* (4.9%; 5/102). *Pasteurella multocida*, *Staphylococcus hyicus*, *S. caseolyticus*, *S. saccharolyticus* and *Actiomyces* (*Corynebacterium*) *pyogenes* were represented 0.98% (1/102) for each one. The overall isolates of *M. haemolytica* were comprised of *M. haemolytica* biotype A (90.6%; 77/85) and *M. haemolytica* biotype T (9.4%; 8/85). The study clearly pointed that *M. haemolytica* biotype A was the main etiological agent of pneumonia, and highlighted the presence of *C. pseudotuberculosis* and *Staphylococcus* spp., in particular, within the etiological agents of the disease.

Key words: Caprine, goat, mannheimia, pasteurella, pasteurellosis, pneumonia

INTRODUCTION

Goats are playing a major role in the livelihood of many people in the world particular in tropic and sub-tropic zones. In Sudan, their population was estimated at 43,104,000 head (AOAD, 2009) which form a great wealth of different animal products.

Pneumonia in goats is one of the most important infections that are frequently diagnosed in veterinary clinics and abattoirs of the country. The bacterial agents that probably causing the disease were either rarely investigated or out of the scope of studies. This is due to the growing interest in studying contagious caprine pleuropneumonia, which is more common in goats and causes heavy losses (OIE, 2008).

This study attempted to provide baseline information on the causative agents of bacterial pneumonia in goats.

MATERIALS AND METHODS

Sampling methods: Two hundred samples of pneumonic lesions were collected from goats brought from different animal markets of Sudan to the abattoirs in Khartoum state from January to July, 2008. Small piece from the periphery of each pneumonic lesion was taken by sterile scissor at post-mortem examination for bacteriological processing in National Health Laboratory, Khartoum.

Bacteriological methods: The surface of each lung was seared by a hot spatula and incised. The inner surface of the incision was sampled with sterile swab and cultured on 10% defibrinated sheep blood agar at 37°C for 24-48 h. If no growth was evident during this period, the blood plate was discharged as negative. The isolated micro-organisms were identified according to procedure described by Barrow and Feltham (1993).

Table 1: The frequency and percentage of isolated bacterial from pneumonic lesions of goats

Species of bacteria	Frequency	Percentage (%)
Mannheimia haemolytica	85	83.3
Corynebacterium pseudotuberculosis	7	6.9
α-haemolytic *Streptococci*	5	4.9
Pasteurella multocida	1	0.98
Staphylococcus hyicus	1	0.98
S. caseolyticus	1	0.98
S. saccharolyticus	1	0.98
Actiomyces pyogenes	1	0.98
Total	102	100

RESULTS AND DISCUSSION

The frequency and percentage of isolated bacteria were demonstrated in Table 1. The proportion of all pneumonic lungs that yielded different bacterial isolates was 51% (102/200). *Mannheimia* (*Pasteurella*) *haemolytica* was represented the vast majority of the isolates followed by *Corynebacterium pseudotuberculosis*, α-haemolytic *Streptococci*, *Pasteurella multocida*, *Staphylococcus hyicus*, *S. caseolyticus*, *S. saccharolyticus* and *Actiomyces* (*Corynebacterium*) *pyogenes*.

Further identification of *Mannheimia haemolytica* into biotypes was explained in Table 2.

Corresponding Author: Salaheddin Omer Hassan, Veterinary Research Laboratory, Port Sudan, Sudan, Tel.: (+249) 122305589; Fax: (+249) 311 827295

Table 2: The frequency and percentage of *Mannheimia haemolytica* biotypes

Biotypes of *M. haemolytica*	Frequency	Percentage (%)
M. haemolytica biotype A	77	90.6
M. haemolytica biotype T (*Bibersteinia trehalosi*)	8	9.4
Total	85	100

A total of 60% (3/5) of α-haemolytic *Streptococci* was isolated from mixed infections with *M. haemolytica* biotype A, *M. haemolytica* biotype T and *S. hyicus*.

The result presented here is consistent with those of other who reported that *M. haemolytica* biotype A is the main causative agent of pneumonia in goats (Odendaal and Henton, 1995; Ilhan1 and Keles, 2007). In other words mannheimiosis is the most common bacterial respiratory disease in goats and possibly sheep in Sudan (Hussein and Elsawi, 1984). This finding was most likely due to sudden environmental changes and others stressful conditions such as transportation, overcrowded pens, exposure to the direct sun light prior to slaughter and different infections which were noticeable at post-mortem examination. It is well established that mannheimiosis resulted from interaction of stress factors, defence mechanism and *M. haemolytica* which naturally habitats the respiratory tract of goats (Brogden *et al*., 1998).

The study also pointed that *M. haemolytica* biotype T (*Bibersteinia trehalosi*) and *Pasteurella multocida* may be encountered as causative agents of pneumonic pasteurellosis, although they were few.

The frequent isolation of α-haemolytic *Streptococci* with *M. haemolytica* biotypes A and T from same pneumonic lesions appear to be compatible with the belief that pneumonic pasteurellosis is complex and multifactorial disease (Brogden *et al*., 1998).

It is worth mentioning that Morel's disease (sheep abscess disease) and caseous lymphadenitis which are caused, respectively, by different species of *Staphylococci* and *C. pseudotuberculosis* are prevalent in small ruminants in Sudan (Salih, 1997; Musa, 1998). Interestingly, *S. hyicus*, *S. caseolyticus* and *S. saccharolyticus* were found in considerable proportions among the etiological agents of sheep abscess disease (Salih, 1997). Therefore, it could be concluded that pneumonia caused by *C. pseudotuberculosis* and *Staphylococci* spp., in current study, may be occurred as a consequence of environmental contamination with suppurative materials oozing from infected lymph nodes or as a result of dissemination of infection to the lungs through lymphatic or hematogenous routes. However, *Corynebacterium* spp., *Streptococci* spp. and *Staphylococci* spp. were isolated from pneumonic lungs of goats by other investigators (Ugochukwu and Agwu, 1991; Young and Griffith, 1985).

In view of the present information, improvement of environmental conditions and management systems will lead to a reduction of respiratory diseases particularly mannheimiosis. Additionally, disease surveillances are greatly required for effective control of other infectious agents.

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