

## COMPARATIVE STUDY ON THE BACTERIAL CAUSES OF OVINE KERATOCONJUNCTIVITIS IN NATIVE BREED SHEEP AND GOATS

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### ABSTRACT

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Ocular swabs (n=136) were examined bacteriologically, for isolation and identification of the bacterial causes of keratoconjunctivitis in native sheep and goats during the period from September 2010 to November 2011, in Mosul, Iraq. Results revealed isolation of bacteria from 84.4% and 61.1% examined swabs in sheep and goats respectively. The bacterial most prevalent species isolates from sheep included *Corynebacterium ovis*, followed by *Staphylococcus aureus*, *Bacillus spp.*, *Staph. epidermidis*, while, *Bacillus spp.* were most prevalent, followed by *Cor. ovis*, *Staph. aureus* in goats. The results revealed that the most bacterial isolates were sensitive to Norfoxacin and Chloramphenicol.

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*Key words: Bacterial isolation, Eyes, Keratoconjunctivitis, Sheep, Goats.*

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### INTRODUCTION

Infectious Ovine keratoconjunctivitis (IOK) has the common name pink eye. This disease affected sheep of all ages, and more prominent in ewes than lambs (NADS, 2004). Keratoconjunctivitis is inflammation of the covering mucosa of the eye, including orbit and the inner surface of the eyelids. When the inflammation extend to layers below the conjunctiva the diseases called keratoconjunctivitis (Radostits *et al.*, 2007). It is recognized as a common condition affecting the eyes of domestic sheep and goats (Martin, 1991). Suppurative infection lead to sever visual loss in developing countries (Upadhyay *et al.*, 1991 and Mayer *et al.*, 1997). The principle cause of keratoconjunctivitis in domestic sheep and goats was *Mycoplasma conjunctivae* (Baker *et al.*, 2001 and Michael *et al.*, 1972), however NADS (2004) add *Chlamydia psittaci*, as a common pathogen beside other secondary involved bacteria. By using bacterial culture and PCR (Polymerase Chain Reactions) identification *Mycoplasma spp.* and *Branhamella spp.* was the main causes of the disease of bighorn sheep and Silver bell mountains in Arizona (Jansen *et al.*, 2006). Other microorganism such as, *Corynebacterium pyogenes*, *Staphylococcus aureus* have been suspected as etiological agents (Egwn *et al.*, 1989 and Martin, 1983). Close contact of sheep and goats when trough feeding enables rapid spread of infection and probably accounts for the high incidence of the disease during winter months (Schoenian, 2008). Outbreaks in weaned lambs may be associated with overcrowding, dust, long grass and

flies which have been contaminated by infected tear. Handling of the face and head of lambs when drenching may also provide a means of spread, NADS (2004). Treatment by injection with long acting oxytetracyclin may be practical method (Cleon and Swifts, 1988). Protection from sunlight should be provided, and the complete disease eradication is difficult because the organisms that cause the disease are wide-spread and may persist in carrier animals (GiaCometh *et al.*, 2002). So this article trying to clarify the bacterial responsible for keratoconjunctivitis and its significance in native sheep and goats in Mosul, Iraq.

### MATERIALS and METHODS

One hundred and thirty six ocular swabs (64 sheep, 72 goats) were collected from both eyes of different ages and both sexes native sheep and goats during the period September 2010 to November 2011. Diseased animal show signs of keratoconjunctivitis (blepharospasm and weeping from affected eye, watery tear in early stage followed by the appearance of mucopurulent).

Samples were taken from conjunctivae on the lower eyelid with sterile cotton swabs. Each swab was put in to 2ml of sterile nutrient broth to prevent desiccation. Specimens were brought to the laboratory within 2 hours of collection (Quiun *et al.*, 1999 and Baas *et al.*, 1977). Swabs were inoculated on 5% blood agar base, MacConkey agar, Mannitol salt agar. All media were incubated aerobically at 37 C° for 24h (Quiun *et al.*, 2002). Bacterial colonies

were studied, the isolates were identified by biochemical test (Barown, 2005). Antibacterial sensitivity tests were carried out on these isolates and included, Tetracycline (TE)30µg, Norfloxacin (NOR)10µg, Chloramphenicol (C)30µg, Gentamicin (GN)10µg, Erythromycin (E)15µg (Koneman *et al.*, 1992 and Seely, 1981).

### RESULTS

The results of present study revealed that the bacterial isolates from infected eyes of goats were 61.1%, including isolation from right eyes 55.6% and 66.7% from left one, However in sheep the percentage of bacterial isolates were 84.4%, including 81.3% from the right eyes and 87.5% from the left eyes (Table 1).

The most common bacterial isolates in goats were *Bacillus spp.* 63.6%, *Corynebacterium ovis* 11.4%, *Staphylococcus aureus* 6.8%, *Escherichia coli*, *Staph. epidermidis* and *Staph. Saprophyticus*, 4.5% for each one, *Cor . pilosum* and Mould 2.3% for each one (Table 2). While in sheep it have been detected that *Corynebacterium ovis* 31.5%, *Staphylococcus aureus* 25.9%, *Bacillus spp.* 14.8, *Staph. epidermidis*, 11.1%, *Pseudomonas aeruginosa* and yeast 5.6% for each one, *Staph. Saprophyticus* (3.7%), and *Micrococcus spp.* (1.9%) (Table3). One sample revealed more than one colony uncommon isolate and ignore. Antibiotic sensitivity test revealed that the most bacterial isolates were sensitive to Norfloxacin and Chloramphenicol except *E. coli* and *Pseudomonas aeruginosa* (Table 4).

**Table 1:** Percentage of infected eye swabs collected from sheep and goats.

| Direction of the eye               | Animal species |        |
|------------------------------------|----------------|--------|
|                                    | Sheep          | Goats  |
| Right eye                          | 26/32          | 20/36  |
| No. of positive/No. of sample (%)  | (81.3)         | (55.6) |
| Left eye                           | 28/32          | 24/36  |
| No. of positive /No. of sample (%) | (87.5)         | (66.7) |
| Total                              | 54/64          | 44/72  |
| (%)                                | (84.4)         | (61.1) |

**Table 2:** Bacterial species isolated from Goats affected with Keratoconjunctivitis.

| Bacterial species            | Direction of the eye |        | Total (%) |
|------------------------------|----------------------|--------|-----------|
|                              | Right                | Left   |           |
| <i>Bacillus spp</i>          | 14                   | 14     | 28(63.6)  |
| <i>Corynebacterium ovis</i>  | 2                    | 3      | 5(11.4)   |
| <i>Staphylococcus aureus</i> | 1                    | 2      | 3(6.8)    |
| <i>Staph. saprophyticus</i>  | -                    | 2      | 2(4.5)    |
| <i>Staph. Epidermidis</i>    | -                    | 2      | 2(4.5)    |
| <i>Escherichia coli</i>      | 1                    | 1      | 2(4.5)    |
| <i>Cor.pilosum</i>           | 1                    | -      | 1(2.3)    |
| Mould                        | 1                    | -      | 1(2.3)    |
| Total                        | 20                   | 24     | 44        |
| (%)                          | (45.5)               | (54.5) | (100)     |

**Table3:** Bacterial species isolated from sheep affected with keratoconjunctivitis.

| Bacterial species             | Direction of the eye |        | Total (%) |
|-------------------------------|----------------------|--------|-----------|
|                               | Right                | Left   |           |
| <i>Corynebacterium ovis</i>   | 8                    | 9      | 17(31.5)  |
| <i>Staphylococcus aureus</i>  | 7                    | 7      | 14(25.9)  |
| <i>Bacillus spp</i>           | 4                    | 4      | 8(14.8)   |
| <i>Staph. Epidermidis</i>     | 3                    | 3      | 6(11.1)   |
| <i>Pseudomonas aeruginosa</i> | 1                    | 2      | 3(5.6)    |
| Yeast                         | 1                    | 2      | 3(5.6)    |
| <i>Staph. Saprophyticus</i>   | 1                    | 1      | 2(3.7)    |
| <i>Micrococcus spp</i>        | 1                    | -      | 1(1.9)    |
| Total                         | 26                   | 28     | 54        |
| (%)                           | (48.1)               | (51.9) | (100)     |

Table 4: Antibiotics sensitivity test for bacterial species isolated from keratoconjunctivitis in sheep and goats.

| Bacterial species             | TE | NOR | C  | GN | E  |
|-------------------------------|----|-----|----|----|----|
| <i>Corynebacterium ovis</i>   | R  | S   | S  | S  | S  |
| <i>Cor. pilosum</i>           | R  | S   | S  | S  | S  |
| <i>Staphylococcus aureus</i>  | S  | S   | S  | R  | S  |
| <i>Staph. epidermidis</i>     | S  | S   | S  | R  | S  |
| <i>Staph. saprophyticus</i>   | S  | S   | S  | R  | R  |
| <i>Bacillus spp</i>           | ND | ND  | ND | ND | ND |
| <i>Escherichia coli</i>       | S  | R   | S  | R  | R  |
| <i>Pseudomonas aeruginosa</i> | S  | S   | R  | R  | R  |
| <i>Micrococcus spp</i>        | S  | S   | S  | S  | S  |

S: sensitive, R: resistance, ND: not done

TE: Tetracycline, NOR: Norfloxacin, C: Chloramphenicol, GN: Gentamicin, E: Erythromycin

### DISCUSSION

Infectious keratoconjunctivitis is considered a worldwide disease of sheep and goats (GiaCometh *et al.*, 2002). Results of the present study revealed different bacterial isolates identified from affected both eyes in goats and sheep, in percentage (61.1%) and (84.4% ) respectively, Aitken (2007) mentioned that the keratoconjunctivitis may affected one or both eyes and the disease animal show hyperemia of the vessels, lacrimation, corneal opacity and photophobia. The case may progress to mucopurulent conjunctivitis and corneal ulceration resulting in corneal opacity and transient blindness. Bacterial isolates from affected animal in both species revealed different species of bacterial isolation such as *Corynebacterium spp.*, *Staphylococcus aureus*, *Bacillus spp.*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Micrococcus spp.* These isolates were also detected by GiaCometh *et al.* (2002); Akerstedt and Hofshagen, (2004) and Dagnall, (1994). Moreover Fungi was isolated from conjunctivitis of goats and sheep the Similar results were reported by Baas *et al.* (1977) and Langford, (1971). Other samples were negative for bacteriological isolation because the disease occurred due to other microorganisms such as viral infection, Chlamydia and Mycoplasma infection Michael *et al.* (1972); Egwn *et al.* (1989) and Andrews *et al.* (1987). Results of antibiotics sensitivity test show high sensitivity of bacterial isolates to the antibiotics used except *E. coli* and *Pseudomonas aeruginosa*. These results agreement with Al- Rashidy, (1998) who found that the bacterial isolates were sensitive for Norfloxacin and Chloramphenicol. However *E. coli* and *Pseudomonas aeruginosa* were most bacteria which was resistant to antibiotics due to many factors related to the causative agents itself or natural as well

as acquired resistance of the microorganisms Koneman *et al.* (1992).

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### دراسة بكتيرية مقارنة لأسباب مرض التهاب القرنية والملتحمة في العين للسلاسل المحلية للأغنام والماعز

ماجد شيال رحيمه ، بلسم يحيى رشيد ، خضر جاسم حسين

تم فحص ١٣٦ مسحة عين لغرض الفحص البكتيريولوجي وعزل وتشخيص بعض الجراثيم المسببة لالتهاب الملتحمة والقرنية المعدي في الأغنام والماعز المحلي في مدينة الموصل (الموصل - العراق) للفترة من أيلول ٢٠١٠ - تشرين الثاني ٢٠١١. أشارت النتائج إلى عزل الجراثيم بنسبة ٨٤,٤% و ٦١,١% من المسحات المفحوصة في الأغنام والماعز على التوالي. الأجناس البكتيرية المعزولة من الأغنام شملت الوندبات الضائية بأعلى نسبة أعقبها جراثيم المكورات العنقودية القحبية والحصيات والمكورات العنقودية الجلدية بينما عزلت جراثيم العصيات بأعلى نسبة أعقبها الوندبات الضائية والمكورات العنقودية القحبية في الماعز. كما أشارت النتائج إلى أن معظم الجراثيم المعزولة كانت حساسة للنفورلوكساسين والكلورمفينيكول.