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IDENTIFICATION OF THE BACTERIAL CAUSES OF CALVES EYE INFECTION IN SUDAN
(With1Tab&1 Fig)

By

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التعريف على الأسباب البكتيرية التي تصيب عيون العجول في السودان

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الملخص العربي

أجريت هذه الدراسة لمعرفة البكتيريا المسببة لالتهاب العيون في العجول في ولاية الخرطوم - السودان. تم جمع 65عينة باستخدام المساحات المعمقة من عيون أظهرت مستويات انتشار الدموع، تترحع العيون وعثرة القرنية. تم استخدام الاوساط المزرعية (غاز مغذي، غاز الدم و اغبار مكون من طريقة صبغة جرام و الاختبارات الكيميائية الحيوية، اختبار الحساسية القرصي لعمل معرفة عوامل التهاب العيون. النتيجة فق أوضحت أن 61.6% من البكتيريا المعزولة موضعية لصبغة جرام 40 عينات (من 25) 38.4% عينات سائلية. صبغة جرام لذكر أدوات الاصطناعات الكيميائية الحيوية أن 16 من البكتيريا المعزولة هي البكتيريا العنقودية (24.6%)، و أن 16 منها هي البكتيريا العنقودية السببية (15.6%)، و من البكتيريا هي من أنواع الميكروبات (66.2%)، 10 هي البكتيريا الحوضية (15.4%)، 8 من البكتيريا هي من نوع المورسكيلا (12.3%) و 17 من البكتيريا هي من نوع البكتيريا الامامية (26.1%) معظم البكتيريا موجبة الجرام (67.5%) كانت حساسة للمضادات الحيوية اوفلاكساسين 0.5, يوم (75%) حساسة للمضادات الحيوية بلكوكساسين 0.4, يوم مقاومة للمضادات الحيوية سلوكاسين و سيفالوكسين و روكوبتريوميسین و أينوميسین. لكن البكتيريا سالبة الجرام (100%) كانت حساسة للمضادات الحيوية اميكاسين 0.9, يوم (78%) كلوراميفينكون 0.7, يوم و مقاومة للمضادات الحيوية سيفالوكسين و جاتيفالوكاسين. يظهر أن العوامل النفسية المتعلقة بالموضوع و كذلك التشخيص و العلاج الفعال.
SUMMARY

This study was planned to identify the bacterial causes of eye infection in calves in Khartoum State-Sudan. A total of 65 eye swabs were collected from calves clinically showing lacrimation, ulceration of the eye and corneal opacity. Culture media (nutrient agar, blood agar and MacConkey’s agar), Gram’s stain technique, biochemical and disc sensitivity tests were used for isolation and identification of the causes of eye infection. The results revealed that 61.6% of the isolates were Gram positive (40 samples) and 38.4% (25 samples) were Gram negative. Biochemical tests confirmed that 16 of the isolates were Staphylococcus spp (24.6%), 10 isolates were Streptococcus spp (15.4%), 4 isolates were Micrococcus spp (6.2%), 10 isolates were Bacillus spp (15.4%), 8 isolates were Moraxella spp (12.3%) and 17 isolates were Enterobacter spp (26.2%). Most of the Gram positive bacteria (67.5%) were sensitive to Pefloxcacin (1.1-0.4Cm) and (75%) were sensitive to Ofloxacin (1-0.5Cm) and resistant to Cloxacillin, Roxythromycin, Cephalexin and Linomycin. While all Gram negative bacteria (100%) were sensitive to Amikacin (1-0.9Cm) and (68%) Chloramphincol (1-0.7Cm) and resistant to Cefitoxime and Gatifloxacin. The management of eye infection in calves depends on a sound understanding of etiological agents, relevant risk factors and the effective approaches to diagnosis and treatment.

INTRODUCTION

Eye infection in calves leads to economic losses arising from decreased weight again, treatment cost and loss in production generally (Quinn, et al. 2002). The primary cause of this infection is Moraxella spp, but other organisms are included such as Chlamydia, Mycoplasma and infectious bovine rhinotracheitis (IBR) virus (Lallman and Kirkpatrick, 2007). Other diseases incriminated were ocular squamous cell carcinoma, bovine malignant catarrhal fever (Teague, 2010). Richettsia-like organisms, psittacosis, lymphogranuloma trachoma group are also reported as causes of the eye infection (Mattinson and Cox, 1982). The infection can also be caused by the fungus Aspergillus flavus in these animals (Mossaad, et al. 2010). The isolation of Listeria as a causative agent from corneal infection as the primary pathogenic organism was also reported by Sanchez, et al. (2001). Predisposing factors are vitamin
A deficiency, unpigmented eyelids and white hair on the face which do not absorb ultraviolet light and plant material or dust which increase the susceptibility of calves to eye infection (El Sanousi, 1977; Hilton, 2002). Corneal redness and ulceration, sensitivity to light and pain are the commonest signs of eye infection (Whittier, et al. 2009). The treatment of eye infection involves the usage of antibiotics, for reduction of the numbers of bacteria, including injectable oxytetracycline, topical gentamicin, subconjunctival injection of penicillin and anti-inflammatory corticosteroids (Murphy and Franks, 2003). Injection of dexamethasone into the bulbar conjunctiva and suturing the third eyelid over the eye with an eye ointment was also used (Walker, 2007).

The present study was undertaken to highlight the bacteriological agents that cause infection of the eye in calves and susceptibility the antibiotic, antibacterial.

MATERIALS AND METHODS

A total of 65 conjunctival swabs were collected from calves aged one month to one year. Thirty four males and 31 females, showing symptoms of lacrimation, ulceration of the eyes and corneal opacity with no other clinical signs was present in these animals. Forty four samples were collected from calves from Omdurman and 21 samples from the Nile East locality, in Khartoum State. Most of these animals were cross breed (98%). The swabs were taken for bacteriological examination using the technique previously described by El Sanousi, et al (1971); the head was securely restrained, the eyelids were forced open and the swab was placed onto the conjunctiva and the eyelids were permitted to close over the swab. After the swabs were saturated with the eye secretion, and then gently removed to avoid contamination with the skin. The swabs were inoculated onto 5% defibrinated sheep blood agar, MacConkey’s agar, and nutrient agar and incubated at 37°C for 24 hours and examined for the growth of the bacteria (Oxoid, 1973). The organisms were identified according to the methods of Barrow and Feltham (2003). Gram’s staining technique, biochemical tests and antibacterial sensitivity test were used.

RESULTS

In this study 65 calves susceptible to eye infections, showing lacrimation, ulceration of the eye and corneal opacity were examined. The results revealed that 61.6% of the isolates were Gram positive (40 samples) and
38.4% were Gram negative (25 samples). Biochemical tests (Fig1) confirmed that 16 of the isolates were *Staphylococcus spp* (24.6%), 10 isolates were *Streptococcus spp* (15.4%), 4 isolates were *Micrococcus spp* (6.2%), 10 isolates were *Bacillus spp* (15.4%), 8 isolates were *Moraxella spp* (12.3%) and 17 isolates were *Enterobacter spp* (26.2%). Most of Gram positive bacteria (67.5%) were sensitive to Pefloxacin (1.1-0.4Cm) and (75%) were sensitive to Oflaxacin (1-0.5Cm) and resistant to Cloxacillin, Roxythromycin, Cephalexin and Linomycin. All Gram negative bacteria (100%) were sensitive to Amikacin (1-0.9Cm) and (68%) Chloramphincol (1-0.7Cm) and resistant to Ceftizoxime and Gatifloxacin (Table 1).

<table>
<thead>
<tr>
<th>Antibiotic used</th>
<th>No of isolates examined</th>
<th>No of sensitive isolates</th>
<th>No of resistant isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ampicillin/Sulbactam</td>
<td>65*</td>
<td>8</td>
<td>57</td>
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<tr>
<td>Tetracyclin</td>
<td>65*</td>
<td>44</td>
<td>21</td>
</tr>
<tr>
<td>Co-Trimoxazole</td>
<td>65*</td>
<td>-</td>
<td>65</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>65*</td>
<td>20</td>
<td>45</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>65*</td>
<td>39</td>
<td>26</td>
</tr>
<tr>
<td>Oflaxacin</td>
<td>65*</td>
<td>55</td>
<td>10</td>
</tr>
<tr>
<td>Gentamycin</td>
<td>65*</td>
<td>65</td>
<td>-</td>
</tr>
<tr>
<td>Cephalexin</td>
<td>40**</td>
<td>7</td>
<td>33</td>
</tr>
<tr>
<td>Pefloxacin</td>
<td>40**</td>
<td>40</td>
<td>-</td>
</tr>
<tr>
<td>Cloxacillin</td>
<td>40**</td>
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<td>40</td>
</tr>
<tr>
<td>Roxythromycin</td>
<td>40**</td>
<td>10</td>
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</tr>
<tr>
<td>Linomycin</td>
<td>40**</td>
<td>-</td>
<td>40</td>
</tr>
<tr>
<td>Piperocillin/Tazobactam</td>
<td>25***</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>Chloramphincol</td>
<td>25***</td>
<td>17</td>
<td>8</td>
</tr>
<tr>
<td>Ceftizoxime</td>
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</tr>
<tr>
<td>Amikacin</td>
<td>25***</td>
<td>25</td>
<td>-</td>
</tr>
<tr>
<td>Gatifloxacin</td>
<td>25***</td>
<td>-</td>
<td>25</td>
</tr>
</tbody>
</table>

* Gram positive and Gram negative isolates
** Gram positive isolates
*** Gram negative isolates
DISCUSSION

The infection of the eye in calves is an economically important often frustrating infection in these animals. This study indicates that several types of bacteria could be considered as causes of the infection other than M.bovis, such as Staphylococcus spp, Streptococcus spp, Micrococcus spp, Bacillus spp and Enterobacter spp. These results agree with the findings of El Sanousi (1984). The infection in these animals may cause severe inflammation in the eyes leading to temporary or permanent blindness (Walker, 2007). In present results Staphylococcus Spp and Streptococcus Spp were isolated, This is in agreement with Sanchez, et al. (2001) who reported that a variety of aerobic organisms such as Staphylococcus Spp, Streptococcus Spp, Pseudomonas spp and Enterobacteriaceae may cause secondary infections and Moraxella spp causes primary conjunctivitis. In another study, Micrococcus, Streptococcus, Moraxella and Bacillus were considered the principal genera responsible for bacterial ulcerative keratitis (Keller, et al. 2005). This finding is similar to present results. Treatment of individual animals should be initiated early to prevent damage to the eye. According to antimicrobial sensitivity studies, Gram positive organisms are most often susceptible to Ofloxacin and Pefloxacin and Gram negative organisms
are susceptible to Amikacin. Foti, et al. (2012) described the resistance of Staphylococcus aureus to Methicillin (Oxacillin). Gram positive bacteria are resistant to Cloxacillin, Roxithromycin, Cephalexin and Linomycin which Gram negative bacteria resistant to Ceftizoxime and Gatifloxacin.

REFERENCES


