Conjunctival Bacterial and Fungal Isolates in Clinically Healthy Working Horses in Iran

Abdullah ARAGHI-SOOREH 1 Masoud NAVIDI 2 Mazdak RAZI 3
1 Department of Clinical Sciences, Faculty of Veterinary Medicine, Urmia Branch, Islamic Azad University, Urmia - IRAN
2 Graduated from Faculty of Veterinary Medicine, Urmia Branch, Islamic Azad University, Urmia - IRAN
3 Graduated from Faculty of Veterinary Medicine, Urmia Branch, Islamic Azad University, Urmia - IRAN

SUMMARY

This study was conducted to identify bacterial and fungal isolates of the normal eyes in working horses in Iran. Ninety swabs were taken from the conjunctival sac of 45 clinically healthy horses. Aerobic bacterial and fungal cultures were plated. A total of 9 different bacterial species (3 Gram-positive, 6 Gram-negative) and 7 different fungal species (6 molds, 1 yeast) were recovered. Bacillus spp., Staphylococcus spp. and Klebsiella spp. were the most frequently isolated bacteria. Aspergillus spp. and Penicillium spp. were the most frequently recovered fungi. The microbial species isolated are comparable with studies performed on horses in other areas.

Keywords: Bacteria, Fungi, Conjunctiva, Working horse, Iran

INTRODUCTION

Most reports of conjunctival bacterial flora in the healthy horses show predominance of Gram-positive organisms. The most commonly isolated bacteria include Staphylococcus spp., Streptococcus spp., Bacillus spp. and Corynebacterium spp. [1-3]. From fungi genera of Aspergillus, Cladosporium, Penicillium and Mucor predominate in most studies [2-4]. When a corneal erosion/ulceration occurs, resident and transient ocular surface microbes penetrate the sub-epithelial tissue and result in infection [5]. Knowledge of normal conjunctival microflora is important to adopt proper treatment of corneal ulcers. This investigation was conducted to determine the fungal and aerobic bacterial flora in the conjunctival sac of healthy working horses in Iran.
biochemical methods \[6\]. The study was approved by the ethics committee for animal experimentation by the Islamic Azad University-Urmia Branch (Serial No. 1714/2012).

RESULTS

The isolated organisms and the frequencies of isolation are shown in Table 1 and Table 2.

Bacterial Isolates

Gram-positive organisms were the predominant bacteria, comprising 59.51% of isolates. Bacillus spp. (27.68%) was the most frequent isolate, followed by Staphylococcus spp. (24.22%). Gram-negative bacteria comprised 40.49% of all isolates, with Klebsiella spp. being the most prevalent (12.58%).

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Number of Isolates</th>
<th>Percent of Isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gram-positive</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacillus cereus</td>
<td>80</td>
<td>27.68</td>
</tr>
<tr>
<td>Staphylococcus epidermidis</td>
<td>70</td>
<td>24.22</td>
</tr>
<tr>
<td>Beta-haemolytic streptococci</td>
<td>22</td>
<td>7.61</td>
</tr>
<tr>
<td><strong>Gram-negative</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Klebsiella oxytoca</td>
<td>36</td>
<td>12.58</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>23</td>
<td>7.95</td>
</tr>
<tr>
<td>Providencia alcalifaciens</td>
<td>17</td>
<td>5.88</td>
</tr>
<tr>
<td>Enterobacter aerogenes</td>
<td>16</td>
<td>5.53</td>
</tr>
<tr>
<td>Citrobacter diversus</td>
<td>13</td>
<td>4.49</td>
</tr>
<tr>
<td>Proteus spp.</td>
<td>12</td>
<td>4.15</td>
</tr>
<tr>
<td>Total</td>
<td>289</td>
<td>100</td>
</tr>
</tbody>
</table>

Fungal Isolates

Molds were the predominant fungi, comprising 96.85% of isolates. Aspergillus spp. (48.03%) was the most frequent isolate, followed by Penicillium spp. (25.59%). Candida spp. (3.14%) was the only isolated yeast species.

DISCUSSION

Bacillus spp. was the most frequently isolated bacterial organism in our study. This organism has been reported in several different studies as the most common isolate of conjunctival sac in healthy horses \[1,3,7\]. Bacillus spp. is usually considered as a non-pathogenic organism that isolate from healthy and diseased eyes \[8\].

Other Gram-positive isolates of this study especially Beta-haemolytic streptococci as potentially pathogens have been reported frequently from equine infectious keratitis \[8,9\].

Gram-negative bacteria are the most commonly isolated organisms from infectious keratitis of horses in various studies which include Pseudomonas spp., Acinetobacter spp., Klebsiella spp., Escherichia coli, Moraxella spp. and Providencia spp. \[8,10\]. Most of these potentially pathogenic organisms were isolated from eye of healthy horses in our study.

In various studies, molds vs. yeasts have been reported to be the predominant components of fungal flora in equine normal ocular surface by Aspergillus spp. having first rate \[1,3,4\]. In our study filamentous fungi with predominance of Aspergillus spp. were also the most frequently isolated fungi. Fungal genera isolated in this report are considered saprophytic; however, all of them had reported from equine keratomycosis \[11,12\].

The microbial species isolated in our study are comparable with studies performed on healthy horses in other countries. Most of these isolates are potentially pathogenic organisms.

REFERENCE


