Antibiogram of *Dermatophilus congolensis* Isolates from Cattle

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Abstract

Bovine dermatophilosis has been identified as etiological agent of lower leg dermatitis among cattle in Kerala. Present work was undertaken to study the antibiotic sensitivity pattern of *Dermatophilus congolensis* isolates from cattle in Kerala. A total of 75 isolates of *D. congolensis* obtained during 2010-2011 were subjected to antibiogram studies using Muller-Hinton sheep blood agar. Out of 75 isolates, 74 isolates were sensitive to ciprofloxacin (98.7 per cent) and enrofloxacin (98.7 per cent) followed by gentamicin (97.3 per cent), tetracycline (94.7 per cent), ceftriaxone (84 per cent) and streptomycin (81.3 per cent). Seventy six percent of the isolates were found to be sensitive to chloramphenicol and 73.3 per cent to ampicillin, amoxycillin and amoxyclav. Only 53 isolates were sensitive to co-trimoxazole (70.7 per cent) and 31 isolates (41.3 per cent) to Penicillin. Present study provided useful informations regarding the in vitro antibiotic susceptibility of the isolates which in turn will help in selection of the most suitable antibiotics for the treatment.

Key words: Cattle, Dermatitis, Dermatophilus congolensis, antibiogram

Introduction

Bovine dermatophilosis is an economically important skin disease of cattle in tropical countries. It causes considerable economic loss as a result of lowered production, increased culling, downgrading of hide and death (Zaria, 1993). There is no single treatment specific for dermatophilosis. But antibiotic treatment is the one which is most widely used and effective for cure from the clinical signs and to reduce the complications due to secondary infections. Several antibiotics were found to be effective with variable levels of success. Antibiotic sensitivity also varies with the isolate, geographical area and species of the affected animals. Recently dermatophilosis was diagnosed among cattle population of Kerala as the cause of lower leg dermatitis (Tresamol, 2012). The present study describes the in vitro antibiotic susceptibility pattern of 75 isolates of *Dermatophilus congolensis* from cattle of Kerala.

Materials and Methods

Eighty two cattle from different districts of Kerala, with clinical signs such as pustules, scab formation and cracks or fissures on the skin of legs were included in the study. Dermatophilosis was diagnosed in these animals based on direct microscopic examination of the skin scabs (Quinn et al., 1994) which revealed typical tram track appearance of the *Dermatophilus congolensis* by Giemsa and Gram staining.
methods. Cultural isolation of the organism was done from the skin swabs and scabs in seven per cent sheep blood agar under 10 percent carbon dioxide (Haalstra, 1965). Dermatophilus congolensis was isolated from 75 cases. The isolates were identified based on morphological, cultural, biochemical and sugar fermentation tests as per the methods described by Cowan (1974). In vitro antibiotic sensitivity of the isolates was studied using disc diffusion technique (Barry, 1976) in Muller-Hinton sheep blood agar using 12 commonly used antibiotics (Table).

Results and Discussions

Results of antibiogram of 75 isolates of D. congolensis are depicted in Table and Figure. Sensitivity of D. congolensis isolates to most of these antibiotics was also reported by many workers (Gillum et al., 1988; Towersey et al., 1993). Jordon and Venning,(1995) also observed many antibiotics including erythromycin, spiramycin, penicillin G, ampicillin, chloramphenicol, streptomycin, amoxycillin, tetracyclines, and novobiocin to be highly effective in the treatment of dermatophilosis. Minimum inhibitory concentrations (MIC) and minimal bactericidal concentrations (MBC) of antimicrobials on D. congolensis isolates determined by Hermoso de Mendoza et al (1995) revealed that erythromycin, spiramycin, penicillin G, ampicillin, chloramphenicol, streptomycin, amoxycillin, tetracyclines and novobiocin had high serum concentrations and were shown to have potential use for the treatment of dermatophilosis.

The most sensitive antibiotics found in the present study were ciprofloxacin and enrofloxacin. Out of 75 isolates, 74 isolates were sensitive to ciprofloxacin (98.7 per cent) and enrofloxacin (98.7 per cent) and only one was resistant both to enrofloxacin and ciprofloxacin. This finding is contradictory to the findings of most of the workers, who reported resistance of D.congolensis to quinolones. Mannan et al (2009) found that only 10 percent of the isolates from Bangladesh were sensitive to ciprofloxacin and Kruger et al (1998) found resistance of few isolates of D. congolensis to enrofloxacin. Amor et al (2011) found antibiotic resistance to quinolones for an isolate from a human case.

In the present study more than 80 percent of the isolates were found to be sensitive to gentamicin (97.3 per cent), tetracycline (94.7 per cent), ceftriaxone (84 per cent) and streptomycin (81.3 per cent). Seventy six percent of the isolates were found to be sensitive to chloramphenicol and 73.3 per cent to ampicillin, amoxycillin and amoxyclav. Only 53 isolates were sensitive to co-trimoxazole (70.7 per cent) and 31 isolates (41.3 per cent) to Penicillin. Sharma et al (1992) reported resistance of isolates from cattle and buffaloes to chloramphenicol and amoxycillin. Resistance of D. congolensis isolates to co-trimoxazole was also reported by Kruger et al (1998). Even though most of the workers reported susceptibility of
D. congolesis to penicillin, in the present study maximum antibiotic resistance was observed for penicillin. This high rate of resistance might be due to extensive usage of this drug in cattle of this region.

Table 1: Antibiogram of 75 isolates of Dermatophilus congolesis

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Antibiotic</th>
<th>No.of isolates</th>
<th>Sensitive(per cent)</th>
<th>Resistant(per cent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Penicillin</td>
<td>31 (41.3)</td>
<td></td>
<td>44 (58.7)</td>
</tr>
<tr>
<td>2</td>
<td>Streptomycin</td>
<td>61 (81.3)</td>
<td></td>
<td>14 (18.7)</td>
</tr>
<tr>
<td>3</td>
<td>Ampicillin</td>
<td>55 (73.3)</td>
<td></td>
<td>20 (26.7)</td>
</tr>
<tr>
<td>4</td>
<td>Amoxicillin</td>
<td>55 (73.3)</td>
<td></td>
<td>20 (26.7)</td>
</tr>
<tr>
<td>5</td>
<td>Amoxyclav</td>
<td>55 (73.3)</td>
<td></td>
<td>20 (26.7)</td>
</tr>
<tr>
<td>6</td>
<td>Ceftriaxone</td>
<td>63 (84.0)</td>
<td></td>
<td>12 (16.0)</td>
</tr>
<tr>
<td>7</td>
<td>Chloramphenicol</td>
<td>57 (76.0)</td>
<td></td>
<td>18 (24.0)</td>
</tr>
<tr>
<td>8</td>
<td>Ciprofloxacin</td>
<td>74 (98.7)</td>
<td></td>
<td>1 (1.3)</td>
</tr>
<tr>
<td>9</td>
<td>Enrofloxacin</td>
<td>74 (98.7)</td>
<td></td>
<td>1 (1.3)</td>
</tr>
<tr>
<td>10</td>
<td>Tetracycline</td>
<td>71 (94.7)</td>
<td></td>
<td>4 (5.3)</td>
</tr>
<tr>
<td>11</td>
<td>Gentamycin</td>
<td>73 (97.3)</td>
<td></td>
<td>2 (2.7)</td>
</tr>
<tr>
<td>12</td>
<td>Cotrimaxazole</td>
<td>53 (70.7)</td>
<td></td>
<td>22 (29.3)</td>
</tr>
</tbody>
</table>

Fig. Antibiogram of 75 isolates of Dermatophilus congolesis
Considerable variations were observed in the antibiogram pattern of D.congolensis isolates from Kerala compared to other regions. The variations in antibiotic sensitivity and resistance patterns of different isolates may be due to genomic variations, chromosomal or plasmid mutation of the organisms and repeated use of antibiotics as suggested by Mannan et al (2009). The results of the present study will help in the selection of suitable antibiotics for the successful treatment of cases of dermatophilosis. This study also stresses the need for identification of the most suitable antibiotic by conducting antibiogram studies for successful treatment of dermatitis due to D. congolensis.

References


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