AN EPIDEMIOLOGICAL APPROACH TO THE ZOOPHILIC DERMATOPHYTOSES IN IRAN

ALIREZA KHOSRAVI, D.V.M., Ph.D, PARIVASH KORDBACHEH, M.D.,* AND SAEED BOKAEE, D.V.M.

From the Faculty of Veterinary Medicine and * School of Public Health, University of Tehran, Tehran, Islamic Republic of Iran.

ABSTRACT

Dermatophytosis in domestic animals constitutes a constant source of infection for persons in contact with them. To have an epidemiological picture of zoophilic dermatophyte infections in Iran, a study has been carried out during a period of three years (1986-1989) in an attempt to find the causative dermatophytes which infect cats and cattle and also infected human subjects in contact with them.

For this purpose, 9850 samples of hair and skin were collected from suspected cattle, 953 from suspected cats, and 2326 from infected human subjects. Clinical diagnosis was confirmed by direct microscopic examination and culture. The species isolated from all cattle were Trichophyton verrucosum; from cats, Microsporum canis and man, M. canis, 1583 (68.1%) and T. verrucosum 743 (31.9%). From the infected human cases, mostly Tinea capitis and Tinea corporis were detected among the age groups of 1-9 and 20-29 years old, respectively. The incidence rate observed in winter and fall was higher than spring and summer.


INTRODUCTION

Dermatophytosis (ringworm) is the infection of keratinized structures, including the hair, nails, or stratum corneum of the skin, by organisms of fungi termed the dermatophytes. The dermatophytes are a group of fungi comprising three genera, trichophyton, microsporum, and epidermophyton which have the ability to colonize the skin and its appendages. The dermatophytes can be classified as anthropophilic (found mainly in man), zoophilic (found mainly in animals), and geophilic (found mainly in the soil).10

Dermatophyte infections of wild and domestic animals have been recognized for many years. It has been pointed out repeatedly that animals act as a reservoir for human dermatophytosis.7,12 Ringworm disease in domestic animals constitutes a constant source of infection for persons in contact with them. Thus, zoophilic dermatophyte infections are particularly common in rural areas. Fungi from domestic animals, such as dogs and cats, may initiate an epidemic among children.3,4,15

In addition, wild animals also harbor ringworm and may be an indirect source of human infections, since the infected hairs shed from these animals may contaminate dwelling places and working areas.10

Mites also transmit dermatophytes among animal populations.5 Sometimes contamination from rodent carriers leads to outbreaks of severe dermatophytosis in human populations.10

The specific pathologic picture of the infected animal, the dermatophytes involved, and the frequency of transmission of such infections to man have been reviewed by Otenasek6 and Mantovani.7
Dermatophytoses in Iran

PATIENTS AND METHODS

Between May 1986 and December 1989, 9850 cattle, 953 cats and 2326 human cases of suspected dermatophytosis were clinically diagnosed and studied at the Mycology Laboratory of the Faculty of Veterinary Medicine, University of Tehran, by direct microscopic observation of the clinical specimens and by cultures.

Samples of hair and skin scrapings were collected in an envelope and labeled accordingly. Direct microscopic observation of the samples was carried out by examining the material in 10% KOH/DMSO and lactophenol. Each sample was cultured in two plates, containing Sabouraud’s glucose agar with streptomycin and cycloheximide and incubated in two different temperatures (30 and 37 degrees centigrade).

Standard methods and criteria, based on the gross and microscopic morphology of the isolates, were used to identify the isolated strains.

RESULTS

Results of the positive findings by direct microscopic examination of the samples were as follows:

Cattle: 7110 (72.2%), cats: 321 (33.9%) man: 1023 (43.9%).

Since we cultured each sample in four corners of two plates and incubated them in two different temperatures, we obtained better results and the results of all samples were positive.

Isolated species from different samples were as follows:

Cattle: T. verrucosum (Figs. 1, 2)
Cats: M. canis (Figs. 3, 4)
Human: M. canis, 1615 (69.4%), T. verrucosum, 711 (30.4%).

The commonest clinical type of scalp ringworm was ectothrix (Fig. 5). From the infected human cases, Tinea capitis and Tinea corporis were the commonest dermatophytosis in the age groups of 1-9 and 20-29 years old, respectively (Table I), (Figs. 6-9).

In rural areas, the most infectious factor in man was T. verrucosum (3.1%), and in urban areas, M. canis (93.5%), (Table II). The high incidence rate observed in winter and fall was greater than spring and summer (Table III).
DISCUSSION

Dermatophytoses in cattle and cats have worldwide distribution and in most cases the causative organisms are *T. verrucosum* and *M. canis*. It has been pointed out repeatedly that animals act as a reservoir for human dermatophytosis and the infections are transmitted from animals to man.\(^3,5,6,7,11,13\)

Colonization of man by zoophilic dermatophytes usually results in an inflammatory disease. Ectothrix infection with animal origin is distinguished clinically by a more marked inflammatory reaction than other forms of *Tinea capitis*.\(^8\) In this study, in most cases of *Tinea capitis* and *Tinea barbae*, kerion, keloid, and severe inflammatory disease were much more frequent.

In our study, *Tinea capitis* occurred in children, particularly in those between the age of 1 and 9 years, as in other parts of the world.\(^12,14\) There are reports in different countries of limited epidemics of this problem among school children which are contact with animals.\(^1,4,15\)

*Tinea capitis* was more prevalent in female children than in males. The reason for this is not fully understood, but could be partially attributed to the fact that female children keep their hair long and thus make it more difficult to keep it in a clean condition, whereas male children have their hair cut fairly short. However, wearing longer hair usually
Dermatophytoses in Iran

Table I. Age groups of patients related to the different tinea and sex (Iran, 1986-1989).

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>TC</th>
<th>TCo</th>
<th>TB</th>
<th>TU</th>
<th>TM</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-9</td>
<td>F</td>
<td>765</td>
<td>9</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>774</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>363</td>
<td>14</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>377</td>
</tr>
<tr>
<td>10-19</td>
<td>F</td>
<td>178</td>
<td>21</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>199</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>110</td>
<td>30</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>140</td>
</tr>
<tr>
<td>20-29</td>
<td>M</td>
<td>15</td>
<td>251</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>278</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>-</td>
<td>62</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>64</td>
</tr>
<tr>
<td>30-39</td>
<td>M</td>
<td>6</td>
<td>48</td>
<td>51</td>
<td>7</td>
<td>3</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>-</td>
<td>39</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>42</td>
</tr>
<tr>
<td>40-49</td>
<td>M</td>
<td>-</td>
<td>35</td>
<td>29</td>
<td>6</td>
<td>-</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>50+</td>
<td>M</td>
<td>-</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1447</td>
<td>758</td>
<td>95</td>
<td>18</td>
<td>8</td>
<td>2326</td>
</tr>
</tbody>
</table>

TC= Tinea capitis
TCo= Tinea corporis
TB= Tinea barbae
TU= Tinea unguium
TM= Tinea manuum

Table II. Different tinea related to the locality and etiological agents (Iran, 1986-1989).

<table>
<thead>
<tr>
<th>Tinea</th>
<th>Locality</th>
<th>M. canis</th>
<th>T. verrucosum</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tinea capitis</td>
<td>R</td>
<td>159</td>
<td>417</td>
<td>576</td>
</tr>
<tr>
<td></td>
<td>U</td>
<td>798</td>
<td>73</td>
<td>871</td>
</tr>
<tr>
<td>Tinea corporis</td>
<td>U</td>
<td>49</td>
<td>119</td>
<td>168</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>573</td>
<td>17</td>
<td>590</td>
</tr>
<tr>
<td>Tinea manuum</td>
<td>U</td>
<td>-</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Tinea barbae</td>
<td>R</td>
<td>18</td>
<td>56</td>
<td>74</td>
</tr>
<tr>
<td>Tinea unguium</td>
<td>U</td>
<td>18</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>16</td>
<td>-</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1615</td>
<td>711</td>
<td>2326</td>
</tr>
</tbody>
</table>

R= Rural area
U= Urban area

It seems probable that temperature and humidity were the reasons for causing differences in seasonal incidences of the dermatophytoses. The rise in the incidence of dermatophytosis in winter and fall was due to lower temperature and higher humidity in these seasons of the year.

ACKNOWLEDGEMENTS

The authors would like to thank all responsible people of Tehran University and health research centers for their valuable help.

REFERENCES

A. Khosravi, D.V.M. et al.