SAPROPHYTIC OCCURRENCE OF TRICHOPHYTON MENTAGROPHYTES AND MICROSPORUM GYPSEUM IN THE COATS OF HEALTHY LABORATORY ANIMALS

(Preliminary Report)

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Abstract

A group of 199 healthy laboratory animals, comprising 63 guinea pigs, 58 white mice, 47 rats and 31 rabbits, was sampled for the presence of pathogenic dermatophytes. T. mentagrophytes, var. granulare, was isolated in 10% (5 guinea pigs, 6 mice, 6 rats and 2 rabbits) and M. gypseum was found in 7 animals (3 guinea pigs, 3 mice and one rat). No ringworm lesions were observed in the respective animals. This is the first report on such findings in Israel.

It is well known that domestic and even sometimes wild animals may be the source of dermatophytic infection. Laboratory animals such as guinea pigs, white mice, rats, rabbits and hamsters may also play a role in the transmission of this fungus disease. In such circumstances the lesions acquired may be considered an 'occupational' dermatophytosis, with Trichophyton mentagrophytes (either the 'granular' or the 'quinckeana' variety) being the main causative agent.

Previous reports (1, 7, 12, 13, 14, 17) have shown that Trichophyton mentagrophytes is sometimes found in the coat of apparently healthy laboratory animals, particularly guinea-pigs, without obvious signs of mycotic infection. Fuentes (6) found that even the cosmopolitan soil saprophyte M. gypseum, which occurs only sporadically in human infection, may sometimes exist under similar conditions.

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Material and methods

The material comprised a lot of 199 laboratory animals, including young guinea-pigs, white mice, rats and rabbits, kept in the 'Animal House' of the Beilinson Medical Center. Sterile swabs were used for sampling the animals, instead of the 'hairbrush' technique described by Connole (4) or Mackenzie (16). Taking into consideration that the number of keratinophilic fungi thus isolated also depends upon the thoroughness with which the animal is sampled. Using these swabs, skin scrapings and hairs were obtained from behind the ears, over the head, from the fore limbs and posteriorly. Direct microscopy was not performed on the collected material since culturing is a more reliable diagnostic method. The skin scales and hairs from each swab were transferred onto tubes with Sabouraud's glucose agar (supplemented with actidione and chloramphenicol), which were incubated at room temperature (25-27°C). The inoculated tubes were observed once a week for 6 weeks.

The species and number of animals examined and the incidence of the agents found are summarized in table 1.
Table 1. Incidence of Dermatophytes in the Coat of Healthy Laboratory Animals

<table>
<thead>
<tr>
<th>Animal Species</th>
<th>Nr. examined</th>
<th>Agents isolated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>T.M. M.G.</td>
<td></td>
</tr>
<tr>
<td>Guinea pigs</td>
<td>63</td>
<td>5 3</td>
<td>8</td>
</tr>
<tr>
<td>White mice</td>
<td>58</td>
<td>6 3</td>
<td>9</td>
</tr>
<tr>
<td>Rats</td>
<td>47</td>
<td>6 1</td>
<td>7</td>
</tr>
<tr>
<td>Rabbits</td>
<td>31</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>199</td>
<td>19 7</td>
<td>26</td>
</tr>
</tbody>
</table>

Legend: T.M. Trichophyton mentagrophytes  
M.G. = Microsporum gypseum

Discussion

Only two pathogenic dermatophytes were isolated: T. mentagrophytes, varietas granulare, found in 10% of the animals and M. gypseum, found in 3.5%. To our surprise, the former agent was more frequently isolated from white mice and rats than from guinea pigs. Generally, T. mentagrophytes has been reported as being present in the coat of apparently healthy guinea pigs, with figures varying from 6 to 30%. Mackenzie (16) also noted the isolation of this fungus from a number of white mice, with only 2% presenting very discreet clinical signs. Paveia (17) found a higher percentage of T. mentagrophytes, var. granulosum in white mice, with no clinical lesions. As for rats, T. mentagrophytes has only infrequently been reported as being present in the coat.

Of interest was the finding of T. mentagrophytes in rabbits with no clinical signs of mycotic infection. To our knowledge, there have been no reports of the occurrence of this organism in the healthy coat of rabbits. The rare occasions in which this fungus was isolated from the rabbits it was in the presence of clinical manifestations (2, 3, 10).

Also of interest was the isolation of M. gypseum from the coat of the main experimental animals. The possibly saprophytic habitat of this potentially pathogenic fungus in healthy laboratory animals was reported by Fuentes (6), but only in guinea pigs. There have been no reports of its presence in white mice or rats. Despite its low incidence, it may be presumed that M. gypseum might act as an agent of human infection acquired also from laboratory animals, as is true of T. mentagrophytes, which is the predominant agent responsible for infection in such situations.

The fact that T. mentagrophytes has been isolated in many instances from the coat of healthy laboratory animals, of small wild mammals, mainly rodents (5, 8, 11) and even of some domestic animals (4, 8, 15), like other soil keratinophilic fungi (T. terrestris, T. ajelloi, M. cookei) and that it has been discovered in the soil of more than 15 countries up to now, may provide support to the theory that it originates in the soil.

It must be noted that the possible transmission to man of dermatophytes living saprophytically in the coat of such laboratory animals very much depends upon the predisposition of the individual. Clinical examination of the 6 subjects handling these laboratory animals showed no mycotic lesions on the cutaneous areas coming into contact with the respective guinea pigs, white mice, rats and rabbits.

References