

Survey and case study of dermatophytosis of dog and cat occurring in Seoul area

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서울地域에서 發生한 개와 고양이 皮膚真菌症에 關한 研究

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초록 : 피부진균증 임상소견을 보이거나 Wood램프 검사에서 양성반응을 보인 개와 고양이 66두에 대하여 DTM(dermatophyte test medium)배양을 실시하였다.

배양결과 가장 많이 발생한 진균은 *M. canis*(24회)였으며 이들중 진단시 15증례에서 Wood램프 양성 반응을 보였다.

치료제로 초미립자 글리세오폴빈 12.5mg/kg용량으로 1일 2회 투여한 결과 좋은 치료결과를 보였다. 그리고 1일 2회 투여가 같은 용량의 1일 1회 투여보다 효과가 좋은 것으로 나타났다.

Introduction

Ringworm (dermatophytosis) can be one of several fungi that infect the skin, hair and nails of man and other animals. In dogs and cats, it primarily infects the hair shafts thus making most topical treatments ineffective.

The treatment of choice in dogs and cats is oral griseofulvin given for three weeks or longer if clinical signs indicate².

This study looks at two areas of concern : what species of dermatophyte cause clinical disease in Seoul and the effectiveness of different griseofulvin regimens.

In the Seoul area, ringworm is a common cause of skin disease in dogs and cats. It is also a significant public health concern due to the large number of stray cats which serve as a reservoir for the disease and a source of infection for humans. Cats can serve as carriers of the disease without exhibiting clinical signs.^{1,3}

Materials and Methods

Animals were suspected of having ringworm if they presented with focal areas of alopecia with scaling or erythema. Pruritus was often a complaint but lack of pruritus was not considered a reason to rule out ringworm. The most common location of lesions were the face and eartips.

Animals with suggestive lesions were screened with a Wood's lamp. Strays brought into the clinic were also screened with the Wood's lamp whether or not they had any clinical signs. Wood's lamp tests were considered positive if hair shafts fluoresced an apple green color.

DTM cultures were taken from Wood's lamp positive animals and from any animal with skin lesions suggestive of ringworm. Hair samples were taken from the outer border of the lesions. When applicable, a Wood's lamp was used to highlight hairs suitable for culture.

DTM cultures were called "positive" if the media turned red within ten days of sampling. Colony growth without color change by ten days were not considered positive.

All positives were sent to a human microbiology lab within a local hospital.

There they were recultured and identified by microscopically using lactophenol cotton blue stain.

Griseofulvin therapy was started in any animal with clinical signs suggestive of ringworm, a positive Wood's lamp or a positive DTM. The most common dosage used was 62.5mg/10 lbs(125mg/10kg) SID for 30 days. This same dosage was used as a BID or TID treatment in resistant cases.

The treatment was considered successful if the animal had no clinical signs of ringworm infection after one course of therapy. If the animal was originally Wood's lamp positive, they were rechecked with a Wood's lamp after the therapy when the owner brought the animal back for a recheck.

Results

A total of 66 animals were diagnosed as having ringworm infection. All had DTM cultures taken.

Thirty nine of these were screened with a Wood's lamp during the initial presentation and 22 of these were positive by fluorescence. Fifteen of these were identified as *Microsporium canis* and other species identified were *M gypseum*, *Trichophyton mentagrophyte*, *T rubrum*, *Epidermophyton floccosum*, *Alternaria* sp. and *Penicillium* sp.(Table 1).

Of all cases, 33 were canine, 30 were feline and three were not recorded initially and were lost to follow up.

M canis was identified in 24 cases. Other *Microsporium* species identified were *M gypseum*(2), *M nanum*(1) and *M* species not specified(3). *Trichophyton* species identified were *T mentagrophyte*(4), *T violaceum*(1), *T rubrum*(1) and *T* species not specified(5). One case was identified as *Epidermophyton floccosum* and this was cultured from dog with iatrogenic Cushing's disease(Table 2).

The most common contaminants was *Alternaria* sp.(16) and others included *Penicillium* sp.(5), *Aspergillus* sp.(3), *Cladosporidium*(2) (Table 2).

One sample showed no growth when recultured at the lab performing the microscopic identification.

Therapy results : 32 cases were available for follow-

Table 1. Fungi showing positive on screen test of Wood's lamp during survey

Species of fungi	No. of cases
<i>M canis</i>	15
<i>M gypseum</i>	1
<i>M rubrum</i>	1
<i>Microsporium</i> sp.	1
<i>T mentagrophyte</i>	1
<i>Epidermophyton floccosum</i>	1
<i>Alternaria</i>	1
<i>Penicillium</i>	1
Total	22

Table 2. Species of dermatophytes and contaminants identified in dog and cat during survey

	Species	No. of cases
Dermatophytes	<i>M canis</i>	24
	<i>M gypseum</i>	2
	<i>M nanum</i>	1
	<i>Microsporium</i> sp.	3
	<i>T mentagrophyte</i>	4
	<i>T violaceum</i>	1
	<i>T rubrum</i>	1
	<i>Trichophyton</i> sp.	5
	<i>Epidermophyton floccosum</i>	1
	Contaminants	<i>Alternaria</i>
<i>Penicillium</i>		5
<i>Aspergillus</i>		3
<i>Cladosporidium</i>		2
Total		68

up after therapy of 12.5mg/kg SID or BID of ultramicrosize griseofulvin. Ten cases required an additional course of therapy. Of these 10 cases, eight were SID treatments.

Discussion

M canis was by far the most common dermatophyte species cultured. This finding is consistent with similar surveys done in the United States^{1,3}. The prevalence of *M canis* is probably due to the large stray cat population in Seoul. The majority of the *M canis* cultures were taken from pet cats(16 of 22 cases). Cats have been implicated as carriers of *M canis*.

Of the total sixty-six cases, twenty-two were diagnosed from a positive Wood's lamp. Fifteen of these were diagnosed *M canis*. *M canis* is currently thought to be the only common species which fluoresces under the Wood's lamp.³ The fact that seven other species were "Wood's positive" may be attributed to two possible sources of error : incorrect reading of the Wood's lamp

or incorrect reculture and identification technique. Incorrect reading of the Wood's positive *M canis*. In reculturing the original samples, the lab may have sampled only one colony of a multi-species sample. This would falsely decrease the amount of Wood's positive samples.

If the *M canis* cases are looked at separately, this survey would indicate that sixty-five percent of them fluoresced under the Wood's lamp. This is a higher sensitivity than what is reported in previous studies.³

However, the Wood's lamp test overall is not very effective in detecting dermatophytes and should not be used to rule out dermatophytosis.

DTM cultures should be used to confirm a suspected dermatophyte case and species identification should be used if possible. If the species is known, it may be possible to identify the source of infection.

Contaminant fungi included *Alternaria*, *Penicillium* and *Aspergillus*. The contaminants may have been introduced in either the original culture or in the laboratory's reculture.

The dosage for griseofulvin started in most literature is 50mg/kg.^{2,3} The dosage used in these cases was considerably lower (12.5mg/kg). This dose was effective in eliminating clinical signs in two thirds of the cases. This would indicate that in a significant number of cases a reduced dose is effective. This can be an important consideration in regards to the expense of griseofulvin therapy.

However nearly one-third of these cases still had clinical signs after three weeks. Of these repeat cases, the majority only received the 12mg/kg dose SID.

This would seem to indicate that BID treatments, the animal receives a larger daily dose of the drug. Also, some authors suggest that with BID dosages a greater percentage of the drug is absorbed.

Further studies are indicated to fully evaluate the significance of SID versus BID treatments. The sample size

in this case study was not large enough to make a definitive statement.

The amount of recurrence when using the 12mg/kg dose indicates that the practitioner needs to weigh the cost of the drug and the likelihood of recurrence. A lower dosage will mean less cost to the client, but if the disease recurs the complete treatment will cost the client more. If this dose is used, it should only be as a BID therapy.

This cases were reevaluated after three weeks of treatment. It is important to remember that griseofulvin therapy should be continued for a total of six weeks, even if the clinical signs are gone after three weeks.^{2,3} A shorter course of therapy could result in recurrence or in developing a carrier state in the patient.

Summary

DTM cultures were taken on 66 animals that presented with clinical signs of dermatophytosis or that had a positive Wood's lamp test. Of these cultures, 24 were *Microsporum canis*. Fifteen of the *M canis* cases were detectable by Wood's lamp.

A dosage of 12.5mg/kg BID of ultramicrosize griseofulvin was effective in eliminating clinical signs in nearly all cases. This BID dosage was more effective than the same dose given once daily.

References

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