



Fig. 5. Higher power view of part of Fig. 3. Masses of xanthoma cells, mostly arranged perivascularly, are present beneath the deepest part of the dilated follicular structure ($\times 90$).

findings ruled out other possible pathological changes in the skin, including naevus comedonicus, naevoid follicular epidermolytic hyperkeratosis, acne vulgaris, familial comedones, acne venenata, acne medicamentosa, and comedones after injury to pilosebaceous follicles by ionizing radiation, or in pseudoxanthoma elasticum (1). Trichofolliculoma has rather similar pathological findings, but exhibits clinically a wool-like tuft of immature hair emerging from a central orifice and the lesions are usually solitary (4, 5). The pathological mechanism of comedones in this patient is unknown. The fact that the comedones were confined to the xanthelasma lesions suggests a close relationship between the comedones and xanthelasma. There are two possible explanations for this relationship. First, loose connective tissue around the pilosebaceous unit which was replaced by xanthoma cells might have induced dilation of hair follicles, resulting in the formation of comedones. Second, the destruction of pilosebaceous structures by surrounding xanthoma cells and subsequent abnormal repair of hair follicles might give rise to comedones. In addition, the decrease in elastic fibres throughout the dermis might be involved in the formation of comedones in this case.

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The Changing Clinical Picture of *Microsporum canis* Infections in Sweden

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Abstract. All 22 cases of infections with *Microsporum canis* verified by culture during a five-year period were surveyed. Only tinea corporis was found. The clinical

Table 1. *Clinical data*

N.D. = not done

Pat no.	Sex	Age	Month of onset	Source of infection	Distribution of lesions	Main preliminary diagnosis	Direct K-OH examination
1	F	21	Dec	Cow	Abdomen	Tinea	N.D.
2	F	21	April	Cat	Arm, Neck	Tinea	Pos.
3	F	15	Nov	Horse	Back	Tinea	N.D.
4	F	27	July	Unknown	Face	Tinea	Pos.
5	F	18	Feb	Unknown	Face	Eczema	N.D.
6	F	32	Nov	Cat	Hand, Back	Eczema	Neg.
7	F	60	Sep	Dog	Back	Tinea	Pos.
8	F	20	Oct	Cat	Abdomen, Face, Leg	Tinea	Pos.
9	F	6	Nov	Guinea pig	Abdomen, Back, Leg	Tinea	N.D.
10	F	63	Jan	Unknown	Back	Eczema	Neg.
11	M	11	Aug	Cat, Dog	Back	Pityriasis rosea	Neg.
12	F	22	Jan	Cat	Arm, Back	Pityriasis rosea	Neg.
13	F	20	Dec	Cat (cultured)	Abdomen, Arm, Back	Pityriasis rosea	Neg.
14	F	59	Jan	Cat	Neck, Back	Pityriasis rosea	Pos.
15	F	56	Feb	Cat (cultured)	Abdomen, Arm	Eczema	Neg.
16	F	67	Dec	Unknown	Abdomen, Face	Erythema multiforme	Neg.
17	F	51	Nov	Unknown	Arm, Leg	Granuloma annulare	Neg.
18	M	7	March	Cat	Abdomen, Face	Tinea	Neg.
19	F	29	March	Cat	Abdomen, Arms	Impetigo	Neg.
20	F	53	July	Cat	Arm	Tinea	Neg.
21	F	16	Oct	Cat	Arm, Neck	Pityriasis rosea	Pos.
22	F	16	Oct	Cat	Arm, Neck, Leg	Tinea	Neg.

picture was varied and in more than half of the cases the preliminary diagnosis was other than tinea. The classical tinea capitis was not found in any case. Direct KOH-mounts showed poor correlation to the cultural findings (positive in 33%). It is concluded that mycological screening of certain dermatological disorders should be performed by culturing.

Key words: *Microsporum canis*; Tinea corporis; Direct examination; Culture

The most common dermatophytes isolated from patients at a dermatological clinic in Stockholm during the 1970s were *Trichophyton rubrum* (56%), followed by *Epidermophyton floccosum* (31%) and *Trichophyton mentagrophytes* (12%) (4). *Microsporum canis* has been isolated from slightly less than 1% of the cases. Epidemic tinea capitis in children used to be the classical manifestation of *Microsporum canis* infestation but is now seldom seen (2, 8). During recent decades there is reason to believe that a change in the clinical pattern has taken place (1). The purpose of this investigation was to study the clinical behaviour of infections caused by *Microsporum canis*.

MATERIAL AND METHODS

All patients with dermatophytosis where *Microsporum canis* was isolated during a five-year period were evaluated with respect to anamnestic data, clinical symptoms and signs and effect of treatment. Seven of the 22 cases reviewed were personally investigated by us. Specimens for culture were taken from the active zone of the suspected area and cultured on both Sabbouraud's glucose agar (without antibiotics) and dermatophyte test medium (DTM). Dermatophytes were identified in accordance with colony morphology and microscopic appearance, using standard criteria.

RESULTS

The clinical data of the 22 patients are surveyed in Table 1. Ages ranged from 7 to 67 years (mean 21.5) and female patients predominated (91%). The source of infection was considered to be cats in most cases (78%). The high infectiousness of *Microsporum canis* was demonstrated in two smaller outbreaks originating from two infected cats. The sources of infection were verified by culture in these cases. The first cat caused tinea among several members of four families, the second cat infected two whole families of 5 persons each. The peak

incidence of infection was registered between November and March. *Microsporium canis* was isolated from all patients, with typical morphology and characteristic septate macroconidia, but no glabrous or dysgonic strains appeared (6).

Direct microscopy of KOH-mounted specimens was positive only in 6 cases of 18. The clinical picture varied, and the preliminary diagnosis was tinea in fewer than half of the cases. Pityriasis rosea was held the most probable diagnosis in 5 cases where dry, scaly lesions dominated. Another 4 cases looked like plain eczema without clinical signs of dermatophyte infestation. One inflammatory case with oozing and crusts was misinterpreted as pyoderma, while 2 highly erythematous cases were judged as having non-eczematous lesions.

DISCUSSION

The diagnosis of common dermatophyte infections such as tinea pedis and tinea cruris is seldom a problem in typical cases. But the clinical picture is sometimes untypical or even misleading, as in cases of tinea incognito where other dermatoses are mimicked or where the clinical picture is disturbed by treatment with local steroids (1, 3). Without the aid of reliable laboratory methods the risk of erroneous clinical diagnosis is obvious.

Routine KOH-mounted skin-scrapings are considered to be highly diagnostic by some investigators (7), while others (5) have found poor correlation between the direct examinations and the cultures. In this study only patients with culture-verified *Microsporium canis* infections were investigated. Only one-third of these cases proved positive in the direct examinations, thus indicating that a majority of the patients would have been missed if relying solely on the KOH mounts. This would not be of importance if the clinical picture had been clear-cut. Unfortunately, this is often not the case (1). In this material the preliminary diagnosis at the first visit was other than tinea in 55% of the cases. Most of those with non-inflammatory, dry and slightly scaly lesions were misinterpreted as Pityriasis rosea or eczema. This emphasizes the need for routine mycological screening of certain dermatological disorders and it underlines the importance of performing investigation by culture.

A recent report suggests an increase of Tinea capitis caused by *Microsporium canis* (6), but in our study no scalp infections were found and it must

still be considered a rarity among adults—at least in this particular area.

A seasonal variation, with an increase of infected individuals during the winter has been previously reported (9), but as yet no tenable explanation for the winter peak of incidence has been found.

In conclusion, this study underlines the problems in tracing tinea with the sole aid of the clinical picture and it indicates the importance of using those laboratory methods available, especially culturing, to confirm the diagnosis. Furthermore, the clinical picture of *Microsporium canis* infections in Sweden, as in Israel (1), is wide, and there is a possibility of such variations appearing also in other countries.

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