Original article

Successful treatment of tinea capitis with griseofulvin caused by *Microsporum canis*.

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Abstract

Background Griseofulvin is an antimycotic which has been used successfully as a treatment of tinea capitis caused by dermatophytes.

Objective Our aim was to assess the efficacy of griseofulvin therapy in tinea capitis caused by zoophilic species, *Microsporum canis*.

Patients and methods Nine mycologically confirmed cases of inflammatory and non-inflammatory tinea capitis were enrolled in the study. Griseofulvin therapy was started 10mg/kg once daily at night with milk for 8 weeks and the patients were followed up to 8 weeks after the completion of therapy.

Results Of 9 patients, 4 were males while 5 were female children. The age ranged from 6 to 12 years. The agminate folliculitis type was noted in five patients and grey patch variety was seen in four patients. *Microsporum canis* was the pathogen isolated in all cases. The patients were prescribed griseofulvin. Clinical cure was seen in 89% cases while mycological cure was seen in 100% patients at 16 weeks final evaluation (8 weeks after the completion of therapy). The adverse events were few, mild and reversible in nature.

Conclusion Griseofulvin was found to be effective, well-tolerated and safe therapy for tinea capitis caused by *Microsporum canis*.

Key words
Tinea capitis, griseofulvin, *Microsporum canis.*

Introduction

Tinea capitis is a fungal infection of scalp, skin and hair characterized by erythema, scaling, pruritus and alopecia.[1] Like other dermatophytoses, tinea capitis is also common in this part of the world. Clinical patterns of the disease include noninflammatory (grey patch and black dot) or inflammatory (kerion celsi, agminate folliculitis and favus) types[2] caused by dermatophytes of both genera *Trichophyton* and *Microsporum*.[3] Although grey patch variety is encountered most frequently but agminate folliculitis is not uncommon in our society.[1,2,3] Tinea capitis caused by *M. Canis* is a difficult therapeutic problem which requires an adequate antimycotic therapy.[4]

Griseofulvin is a metabolic product of *Penicillium griseofulvum*, firstly described in 1939.[5] It acts on microtubules and inhibits fungal mitosis.[5] Absorption occurs primarily from the duodenum and jejunum while some quantity also absorbed from ileum, stomach and rectum.[5] The peak plasma level occurs between 2 and 9 hours after administration and remains high for 10 to 20 hours. It is effective for the infections of skin, hair and nails caused by *dermatophytes* but not against *Candida* spp.[5]

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We report nine cases of tinea capitis due to *M. canis* and their successful treatment with griseofulvin therapy.

Patients and Methods

This was an open, clinical, pilot study. Nine children presented with clinically suspected tinea capitis at the mycology clinic of the Department of Dermatology, King Edward Medical College/Mayo Hospital, Lahore were included in the study after taking informed consent. A detailed history and meticulous clinical examination was recorded. The lesions were examined clinically and under Wood's light for any fluorescence. To confirm the diagnosis, specimens from affected scalp area along with hair were taken. The specimens were examined under light microscope after treating with 25% potassium hydroxide and fluorescent microscopy was also done after using calcofluor white stain. For fungus culture, the specimens were inoculated on Sabouraud's dextrose agar together with chloramphenicol and with or without cycloheximide. The cultures were incubated at 25-30^{0}C for 4 to 6 weeks and were examined twice weekly to confirm any negative growth. The positive cultures were identified by gross colonial morphology and microscopic characteristics after making teased mounts of a mature colony and stained with lactophenol cotton blue.

The criteria for inclusion in the study were clinical and mycological evidence of dermatophytosis of the scalp. Those patients who had topical antifungal therapy within 2 weeks or oral antifungal agents within 4 weeks of entering the study were excluded from the study. Patients who had any concomitant topical or systemic treatment were also excluded from the study. Treatment was administered 10mg/kg once daily at night with milk. The therapeutic efficacy of the drug was determined by evaluation at every 2 weeks, end of treatment and at follow-up period by observing the clinical signs, symptoms and mycological examination. The clinical parameters were assessed according to a four-point scale ranging from (0=absent, 1=mild, 2=moderate, and 3=severe) for erythema, scaling (desqumation), edema, pustules, pruritus and hair loss. Hematological investigations performed for each patient before, during and if needed after the treatment were: hemoglobin, hematocrit, white cell count, bilirubin, serum glutamic oxaloacetic transaminase (SGOT), serum glutamate pyruvic transaminase (SGPT), lactate dehydrogenase (LDH), alkaline phosphatase, gamma glutamyl transferase, potassium, creatinine, uric acid, cholesterol and triglycerides.

Results

Of 9 patients, 4 were males while 5 were female children (**Table 1**). The age ranged from 6 to 12 years (mean age, 7.7$\pm$2.02 years). The agminate folliculitis variety was seen in 5 patients while grey patch variety was noted in four patients (**Figure 1**). Physical examination revealed scaling, erythema, pustules, pruritus and alopecia. There was a history of exposure to pet animals (dogs=3, cats=2) in our patients but there was no history of trauma, drug intake, application of medicament or other skin diseases like psoriasis or eczema. Wood's light examination revealed green fluorescence in 4 cases.

M. canis was the pathogen, isolated on fungal culture in all 9 patients. The upper surface of colony revealed whitish hue while yellow pigment was seen on reverse side (**Figure 2**). Teased mounts of a mature colony stained with lactophenol

Table 1 Demographic and clinical data of patients (n=9)

Sr. No.	*Age (yrs)*	*Sex*	*Duration of disease (mo)*	*Clinical variety*	*Wood's lamp examination*	*Fungus culture*
1.	7	M	4	G	+	*M. canis*
2.	6	M	6	A	+	*M. canis*
3.	10	F	2	A	-	*M. canis*
4.	8	F	6	A	+	*M. canis*
5.	12	M	3	G	-	*M. canis*
6.	7	M	4	A	-	*M. canis*
7.	6	F	5	G	+	*M. canis*
8.	7	F	2	G	-	*M. canis*
9.	6.5	F	3	A	-	*M. canis*

M=male, F=female; G=grey patch, A=agminate folliculitis

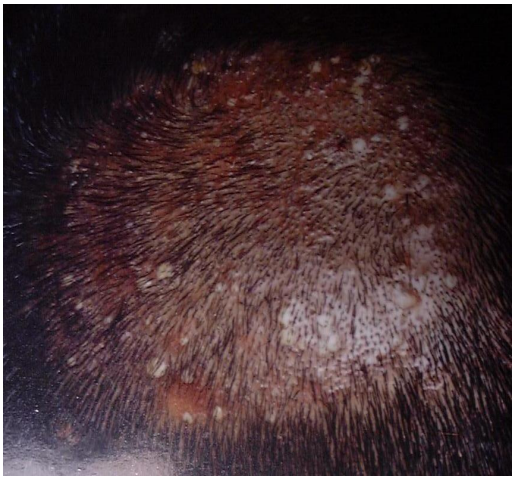

Figure 1 Agminate folliculitis

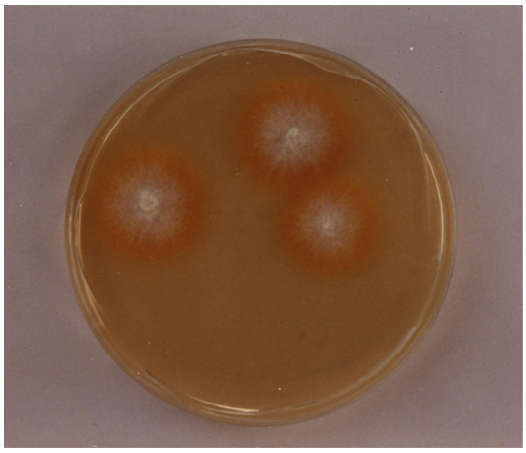

Figure 2 Colony of *M. canis*

cotton blue, revealed spindle-shaped macroconidia (**Figure 3**).

A reduction in the severity of erythema, desquamation, pustules and pruritus was noted during the third week of treatment

Figure 3 Spindle-shaped macroconidia (lactophenol cotton blue mount)

and the improvement continued until the end of treatment and during the follow-up period. Hair loss was not improved at 8 weeks but some regrowth of hair was seen at 12 weeks (4 weeks after the completion of therapy) in the follow-up period and continued slowly at 16 weeks' final evaluation (8 weeks after the end of therapy). Clinical cure was seen in 77.7% cases and mycological cure was noted in 88.8% patients at 8 weeks time while clinical cure was 89% and mycological cure was 100% at final evaluation. One patient developed mild headache while another complained of nausea after intake of griseofulvin which settled after the completion of medication. Griseofulvin treatment was well tolerated and the adverse events were of mild intensity and reversible nature.

Discussion

Tinea capitis is a common pediatric scalp dermatophytosis.[6,7] Topical therapy alone

is ineffective and systemic antifungal agents are the mainstay of treatment.[8,9] Griseofulvin, still 'the gold standard therapy' is being used in many countries due to its good efficacy, cost effectiveness and less number of hazards.[9,10] The new antimycotic agents like terbinafine, itraconazole and fluconazole are effective alternatives but costly and beyond the reach of most patients in Pakistan.

M. canis is a zoophilic fungus which causes grey patch, kerion and agminate folliculitis type of tinea capitis[1-3] and the history of animal exposure in four of our patients reflects animal host for this species.

Our results showed clinical cure in 89% patients and mycological cure in 100% cases at final evaluation with griseofulvin therapy, comparable with the results of similar studies.[10,11] The clinical parameters noted were improved except the hair loss because a longer period is required for hair regrowth.[12-14] In our opinion griseofulvin which is the cheapest of systemic antifungals has shown good antimycotic and antiinflammatory response[7] in this zoophilic infection similar to the studies which reveal that *Microsporum* scalp infections are better treated with griseofulvin rather than new antifungal drug like terbinafine, a better choice for *Trichophyton* scalp infections.[6,15]

In conclusion, the present study showed griseofulvin to be effective, well-tolerated and safe therapy for tinea capitis caused by *M. canis* in our scenario.

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