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Research Article

## EFFICACY OF TREATMENT OF TINEA CAPITIS WITH GRISEOFULVIN INSTIGATED BY MICROSPORUM CANIS

Dr Ayesha Khan<sup>1</sup>, Dr Sana Rafique<sup>2</sup>, Muddassar Ghaffar Qureshi<sup>3</sup>, Dr Haroon Zahoor<sup>4</sup>, Muzzammil Ghaffar Qureshi<sup>5</sup>, Dr Ammara Ghaffar<sup>6</sup>, Dr Maida Ghaffar<sup>7</sup>,

<sup>1</sup> King Edward Medical University, Lahore

<sup>2</sup> Nawaz Sharif Medical College, Lahore

<sup>3</sup> Ameer-ud-din Medical College

<sup>4</sup> Mayo Hospital Lahore

<sup>5</sup> Fatima Memorial College of Medicine and Dentistry, Lahore

<sup>6</sup> Fatima Jinnah Medical University, Lahore

<sup>7</sup> King Edward Medical University, Lahore

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**Abstract:**

*Background:* Griseofulvin is an antifungal agent that has been successfully used in the treatment of dermatophyte-induced tinea capitis.

*Aim:* Our goal was to assess the effectiveness of griseofulvin treatment in tinea capitis caused by the zoophilic species *Microsporum canis*.

*Place and Duration:* In the Dermatology department of Mayo Hospital Lahore for six months duration from September 2019 to February 2020

*Patients and methods:* Nine mycologically confirmed cases of inflammatory and non-inflammatory tinea capitis were included in the study. Griseofulvin treatment was initiated 10 mg / kg once daily at night with milk for 8 weeks, and patients were followed up to 8 weeks after treatment.

*Results:* Of 9 patients, 4 males and 5 females were included. Their age ranged from 6 to 12. The type of acute folliculitis was observed in five patients, and the type of gray patch was observed in four patients. *Microsporum canis* is an isolated pathogen in all cases. Griseofulvin was prescribed to patients. While clinical cure was observed in 89% of cases, mycological cure was observed in 100% at the final evaluation (8 weeks after treatment termination). Adverse events are few, minor and reversible.

*Conclusion:* Griseofulvin has been found to be effective, well tolerated and safe treatment for tinea capitis caused by *Microsporum canis*.

*Key words:* Griseofulvin, Tinea capitis, *Microsporum canis*.

**Corresponding author:**

**Dr. Ayesha Khan,**

King Edward Medical University, Lahore

QR code



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### INTRODUCTION:

Tinea capitis is a fungal infection of the scalp, skin and hair, characterized by erythema, peeling, itching and alopecia. Like other dermatophytoses, tinea capitis is common in this part of the world<sup>1-3</sup>. Clinical disease patterns include non-inflammatory (gray patch and blackheads) or inflammatory (kerion celsi, acute folliculitis and favus) type caused by both dermatophytes of both Trichophyton and Microsporum genus. Although the type of gray patch is more common, acute folliculitis is not uncommon in our society<sup>4-6</sup>. Tinea capitis caused by *M. canis* is a difficult therapeutic problem that requires appropriate antifungal therapy. Griseofulvin is a metabolic product of *Penicillium griseofulvum*, first described in 1939. It works on microtubules and inhibits fungal mitosis<sup>7-9</sup>. Absorption consists mainly of the duodenum and jejunum, while some is absorbed by ileum, stomach and rectum. Maximum plasma levels appear 2 to 9 hours after application and remain high for 10 to 20 hours<sup>10-11</sup>. It is effective for skin, hair and nail infections caused by dermatophytes, but not for *Candida* spp. We report nine cases of tinea capitis due to *M. canis* and their successful treatment with griseofulvin therapy.

### PATIENTS AND METHODS:

This is an open, clinical and pilot study held in the Dermatology department of Mayo Hospital Lahore for six months duration from September 2019 to February 2020. Nine children with clinical suspected tinea capitis were enrolled in the study after informed consent. Detailed history and careful clinical examination were recorded. The lesions were examined clinically and for fluorescence in Wood's light. To confirm the diagnosis, hair samples were taken from the affected area of the scalp. The samples were examined under a light microscope

after treatment with 25% potassium hydroxide, and fluorescence microscopy was also performed after applying white staining with cauliflower. Samples for fungal culture were inoculated with Sabouraud dextrose agar together with chloramphenicol and with or without cycloheximide. Cultures were incubated at 25-30 °C for 4 to 6 weeks and tested twice weekly to confirm negative growth. Positive cultures were identified by colony morphology and microscopic features after making teased mounts of a mature colony and dyed with lactophenol blue cotton. Inclusion criteria are clinical and mycological evidence of scalp mycosis. Patients receiving topical antifungal therapy within 2 weeks or oral antifungal drugs within 4 weeks of enrollment were excluded. Patients receiving any local or systemic treatment were also excluded. Treatment was carried out in the evening 10 mg / kg of milk once a day. The therapeutic effectiveness of the drug was assessed every 2 weeks after the end of treatment and during the observation period, observing 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 (desquamation), edema, pustules, pruritus and hair loss. Haematological tests for each patient before, during and after treatment included: hemoglobin, hematocrit, white blood cell count, bilirubin, serum oxaloacetic glutaminotransferase (SGOT), glutamate pyruvate transaminase (SGPT), lactate dehydrogenase (LDH), alkaline phosphatase, gamma glutamyl transferase, potassium, creatinine, uric acid, cholesterol and triglycerides.

### RESULTS:

4 out of 9 patients are boys and 5 are girls (Table 1). Their age is between 6 and 12 years (average age 7.7 + 2.02 years). The type of acute folliculitis was observed in five patients, while the type of gray patch was observed in four patients (Fig. 1).



Figure 2 Colony of *M. canis*



Figure 1 Agminate folliculitis

Physical examination showed flaking, erythema, pustules, itching and alopecia. Our patients have had contact in the past with accompanying animals (dogs = 3, cats = 2), but no other skin conditions such as trauma, drug use, medication or psoriasis or eczema. Wood's light examination revealed green fluorescence in 4 cases.



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

*M. canis* is a pathogen isolated in mushroom culture in 9 patients. While the upper surface of the colony showed a whitish tint, a yellow pigment was observed in the back (Fig. 2). Teased mounts of a mature colony stained with lactophenol cotton blue, revealed spindle-shaped macroconidia. Hair loss did not improve within 8 weeks, but about 12 weeks (4 weeks after the end of treatment) observed some hair growth during the follow-up period and continued slowly at week 16 of the final assessment (weeks after completing 8 treatments). Clinical

improvement was observed in 77.7% of cases, mycological improvement was observed in 88.8% of patients within 8 weeks, while clinical improvement was observed in 89%, and mycological improvement 100% in final assessment. One patient had a mild headache and the other complained of nausea after taking griseofulvin, which was dissolved after stopping the medicine. Griseofulvin treatment was well tolerated and adverse events were mild and reversible.

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

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

### DISCUSSION:

Ringworm is a common dermatophytosis of the scalp in children. Topical treatment alone is ineffective, and systemic antifungal agents are the basis of treatment<sup>12</sup>. Griseofulvin is still used in many countries because of its "golden standard therapy", good efficacy, cost effectiveness and reduced risk. New antifungal agents such as terbinafine, itraconazole and fluconazole are effective but costly alternatives and are unavailable to most patients in Pakistan<sup>13</sup>. *M. canis* is a fungal fungus that causes gray spot, cyon and acute folliculitis, capitis mycosis, and the exposure history of animals in our four patients reflects the animal host of this species. Our results showed that in a recent assessment, during griseofulvin treatment, 89% of patients had clinical treatment and 100% of cases had mycological treatment and was

comparable to similar studies<sup>14</sup>. Observed clinical parameters have improved, except for hair loss because it takes longer to grow back. In our view, the cheapest systemic antifungal agent, griseofulvin, showed good antifungal and anti-inflammatory response 7, as did studies showing that microsporium scalp infections are best treated with griseofulvin for this bestial infection<sup>15</sup>. New antifungal drugs such as terbinafine, a better option for Trichophyton scalp infections.

### CONCLUSION:

As a result, this study showed that griseofulvin is an effective, well-tolerated and safe treatment for mycosis caused by *M. canis*.

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