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Guidelines for the Management of Tinea Capitis in Children

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Abstract: **Practice guidelines for the treatment of tinea capitis (TC) from the European Society for Pediatric Dermatology are presented. Tinea capitis always requires systemic treatment because topical antifungal agents do not penetrate the hair follicle. Topical treatment is only used as adjuvant therapy to systemic antifungals. The newer oral antifungal agents including terbinafine, itraconazole, and fluconazole appear to have efficacy rates and potential adverse effects similar to those of griseofulvin in children with TC caused by *Trichophyton* species, while requiring a much shorter duration of treatment. They may be, however, more expensive (*Grading of recommendation A; strength of evidence 1a*). Griseofulvin is still the treatment of choice for cases caused by *Microsporum* species. Its efficacy is superior to that of terbinafine (*Grading of recommendation A; strength of evidence 1b*), and although its efficacy and treatment duration is matched by fluconazole (*Grading of recommendation A; strength of evidence 1b*) and itraconazole (*Grading of recommendation A; strength of evidence 1b*), griseofulvin is cheaper. It must be noted, however, that griseofulvin is nowadays not available in certain European countries (e.g., Belgium, Greece, Portugal, and Turkey).**

These guidelines were prepared on behalf of the European Society for Pediatric Dermatology (ESPD). They were edited by the ESPD committee on Tinea Capitis management, namely E. Bonifazi, A. Mota, A. Oranje, H. Sillevis-Smitt, and A. Taieb, and then approved by the board members of ESPD.

DEFINITION—EPIDEMIOLOGY

Tinea capitis (TC) is a dermatophyte infection of the scalp hair follicles and intervening skin, mainly caused by anthropophilic and zoophilic species of the genera *Trichophyton* and *Microsporum* (1,2). Although an overall

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increase in the number of anthropophilic scalp infections is reported in Europe, *Microsporum canis* remains the predominant organism with the highest incidence in the Mediterranean and their bordering countries (3).

TREATMENT

Oral

Tinea capitis always requires systemic treatment because topical antifungal agents do not penetrate the hair follicle. Topical treatment is only used as adjuvant therapy to systemic antifungals. Factors that may influence the choice between equally effective therapies include tolerability, safety, compliance, availability of liquid formulation and cost.

Since the late 1950s, griseofulvin has been the gold standard for systemic therapy of TC. It is active against dermatophytes and has a long-term safety profile. The main disadvantage of griseofulvin is the long duration of treatment required (6–12 weeks or longer) which may lead to reduced compliance (4).

The newer oral antifungal agents including terbinafine, itraconazole, and fluconazole appear to have efficacy rates and potential adverse effects similar to those of griseofulvin in children with TC caused by *Trichophyton* species, while requiring a much shorter duration of treatment. They may be, however, more expensive (5) (*Grading of recommendation A; strength of evidence 1a*). Consequently, the treatment decision between griseofulvin and newer antifungal agents for children with *Trichophyton* spp tinea capitis can be based on an individual patient on the balance between duration of treatment/compliance and economic considerations.

On the contrary griseofulvin is still the treatment of choice for cases caused by *Microsporum* species. Its efficacy is superior to that of terbinafine (6) (*Grading of recommendation A; strength of evidence 1b*), and although its efficacy and treatment duration is matched by that of fluconazole (7) (*Grading of recommendation A; strength of evidence 1b*) and itraconazole (8) (*Grading of recommendation A; strength of evidence 1b*), griseofulvin is cheaper. It must be noted, however, that griseofulvin is nowadays not available in certain European countries (e.g., Belgium, Greece, Portugal, and Turkey). It must be noted that country-specific prescribing information, and formula availability of any antifungal should be considered prior to prescription (Table 1).

TABLE 1. *Dosing Regimens for the Treatment of Tinea Capitis*

Antifungal agent	Dosage	Duration of treatment
Griseofulvin Microsize Ultramicrosize	20–25 mg/kg/day 10–15 mg/kg/day	6–12 weeks or longer until fungal cultures are negative
Terbinafine	10–20 kg: 62.5 mg/day 20–40 kg: 125 mg/day >40 kg: 250 mg/day Or 4–5 mg/kg/day	*Trichophyton* spp.: 2–4 weeks *Microsporum* spp.: 8–12 weeks
Itraconazole	Capsules: 5 mg/kg/day Oral solution: 3 mg/kg/day	Daily dosing: 2–6 weeks Pulse regimen (1 week with 2 weeks off between the first 2 pulses and 3 weeks between the 2nd and 3rd): 2–3 pulses (range: 1–5)
Fluconazole	Daily dosing: 5–6 mg/kg/day Weekly dosing: 8 mg/kg once weekly	3–6 weeks 8–12 weeks

Topical

Adjunctive topical therapies such as Selenium sulfide (9) (*Grade of recommendation B; strength of evidence II a*) or ketoconazole (10) (*Grade of recommendation B; strength of evidence III*) shampoos as well as fungicidal creams or lotions (11) have been shown to decrease the carriage of viable spores responsible for the disease contagion and reinfection and may shorten the cure rate with oral antifungal. The topical fungicidal cream/lotion should be applied to the lesions once daily for a week (11) (*Grade of recommendation C; strength of evidence IV*).

The shampoo should be applied to the scalp and hair for 5 minutes twice weekly for 2–4 weeks (12,13) or three times weekly until the patient is clinically and mycologically cured (4) (*Grade of recommendation C; strength of evidence IV*). The latter in conjunction with 1 week of topical fungicidal cream or lotion application is recommended by the authors.

Follow-up

Clinical and mycologic examinations of the children should be conducted at regular intervals (2–4 weeks). The treatment may be stopped after the culture becomes negative or when hair regrowth is clinically evident; consequently, the duration of treatment can be individualized according to the response.

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APPENDIX

Grading the Evidence

Levels of Evidence

Ia: Evidence obtained from meta-analysis of randomized controlled trials.
Ib: Evidence obtained from at least one randomized controlled trial.
IIa: Evidence obtained from at least one well-designed controlled study without randomization.
IIb: Evidence obtained from at least one other type of well-designed quasi-experimental study.
III: Evidence obtained from well-designed non-experimental descriptive studies such as comparative studies, correlation studies, and case control studies.
IV: Evidence obtained from expert committee reports or opinions or clinical experience of respected authorities.

Grading of Recommendations

A (Evidence levels Ia, Ib)	Requires at least one randomized controlled trial as part of the body of literature of overall good quality and consistency addressing the specific recommendation.
B (Evidence levels IIa, IIb, III)	Requires availability of well-conducted clinical studies but no randomized clinical trials on the topic of recommendation.
C (Evidence level IV)	Requires evidence from expert committee reports or opinions and/or clinical experience of respected authorities. Indicates absence of directly applicable studies of good quality.