Management of Tinea Capitis

What is tinea capitis?
1. Causative organisms: Dermatophyte fungal infection mainly of two genera Microsporum and Trichophyton. The infection is commonly known as scalp ringworm.

2. Transmitted by person to person contact, shared use of contaminated objects such as combs or by person to animal contact (usually with a dog or cat).

Which population is particularly at risk?
1. Children are most commonly affected, adults presenting with tinea capitis may be immunocompromised e.g. HIV infection.

2. Black children appear particularly susceptible to certain infections e.g. those due to Trichophyton tonsurans.

What are the clinical symptoms?
The key clinical symptom is loss of scalp hair (alopecia). Tinea capitis is the single greatest cause of alopecia in children and it occurs regardless of the species of fungus causing the infection. There are four clinical presentations of tinea capitis which may all occur singly or together in the same patient

1. ‘Grey patches’
   - The hair breaks close to the surface or a few millimetres above and there is scalp skin scaling;
   - Small well defined patches join together to form larger ones;
   - Hair loss is usually reversible but may be minimal and difficult to see.;
   - Causative organisms are Microsporum (e.g. M. audouinii and M.canis) and Trichophyton.

2. ‘Black dot’
   - The hair breaks at the surface of the scalp, and appears as swollen black dots, the distribution is diffuse;
   - Hair loss is usually reversible;
   - Causative organisms are Trichophyton species (e.g. T.tonsurans and T.violaceum);
   - ‘These infections are always spread from child to child.

3. Kerion
   - Wet, purulent, inflamed and painful nodules and plaques;
   - The most inflammatory form of tinea capitis (often of animal origin);
   - Hairs do not fall out but can be pulled out without pain;
   - Heals but there may be some scarring.
4. Favus

- Patches of redness and scaling over which there are disc or cup shaped yellow crusts (scutula) pierced by 1 or 2 hairs which do not break;
- A foetid odour may be present;
- After many years of infection atrophic patches develop causing permanent alopecia. Because of its chronicity, favus can be seen in adults;
- These are most commonly seen in remote areas in central and east Africa;
- Causative organism is T.schoenleinii.

In general the clinical symptoms are more inflammatory if the causative species is animal in origin rather than human.

**How is diagnosis confirmed?**

1. Clinical diagnosis is seldom accurate particularly in mild infections and to be certain laboratory confirmation is required (it is recognised that laboratory confirmation may not always be possible and as a consequence there is a strong chance of missed or over diagnosis.)

2. The key to the clinical diagnosis is the presence of broken hairs accompanied by scaling on the scalp. These may be hard to find and the scalp has to be examined thoroughly.

3. Infection caused by *Microsporum* organisms will fluoresce bright green under a filtered ultraviolet (Woods) light. This method is of no use for other infections.

4. Direct microscopy - examining plucked head hairs.

5. Hair is collected using a blunt scalpel or a disposable toothbrush. (Cut hair is no use as the fungi penetrates the upper hair follicle.)

6. Samples should be examined in 10-20% potassium hydroxide. Hyphae and arthrospores can be seen.

7. Culture on routine (Sabouraud’s) medium is effective. A toothbrush or moistened cotton bud can be used to brush the affected area and then to inoculate media.

**What might it be confused with?**

1. Grey patch' seborrhoenic dermatitis, psoriasis, atopic dermatitis;

2. 'Black dot' seborrhoenic dermatitis, psoriasis, atopic dermatitis, lichen planus, alopecia areata;

3. Kerion- cellulitis, furunculosis;

4. Favus- impetigo, ecthyma, crusted severe seborrhoenic dermatitis.

**What preventive measures should be taken?**

1. Ensure that cases are treated quickly to prevent spread amongst a family or school population.

2. Discourage the sharing of combs and head wear.
Which treatments are most effective?

1. Topical treatments are ineffective, they do not reach the inside of the hair shaft where the infection resides, oral antifungals must be given.

2. Terbinafine, itraconazole and griseofulvin have similar efficacy. However terbinafine may resolve the infection in less time if the causative organism is a Trichophyton species.

3. In some countries the only licensed treatment for tinea capitis in children is griseofulvin and it is the cheapest formulation.

4. Oral treatment should be continued for at least 2 weeks (and up to 6 weeks) after the symptoms have been resolved, until fungal cultures are negative. Treatment should be continued if cultures are still positive. It may be necessary to increase the dose of the drug, both griseofulvin and terbinafine can be used at higher doses for longer periods of time.

5. It may also be necessary to explore why treatment has failed. Possible reasons include:
   - Poor compliance with treatment;
   - Poor absorbance of drug;
   - Re-infection.

6. Careful instructions should be given as to the importance of taking the drugs at the right time for the correct period of time and making sure that close contacts are treated if infection is present.

7. Additional measures to prevent the spread of tinea capitis include:
   - Screening close contacts and treating if positive;
   - Cleaning brushes and combs in a bleach solution and restricting the sharing of hair brushes, combs and hats;
   - Exclusion from school until appropriate treatment has been commenced.

8. There is some evidence to suggest that oral therapy should be accompanied by topical selenium sulphide or ketoconazole shampoos. They can reduce infectivity by reducing the carriage of viable spores when used in conjunction with oral treatments. These should be used twice a week by all family members. Ideally they should be rubbed into a lather and left on the scalp for five minutes before being washed off.

What are the common concurrent problems?

1. Secondary bacterial infections and cervical lymphadenopathy are often associated with kerion.

2. Pain when kerion are present. Relief may be provided by removing the overlying crusting. This can be done by soaking gauze in a potassium permanganate solution and laying it on the kerion for ten minutes up to four times a day. Removing the crust will leave a raw or ulcerated area which may require dressing. The main benefit of removing the crust is in pain relief and control of secondary bacterial infection between the crust and skin surface.
**What are the uncommon concurrent problems?**

- Multiple itchy papules sometimes develop once treatment has started, most commonly on the face and upper trunk. This is known as an 'id' reaction probably an immunological reaction to the dermatophyte. Treatment should be continued.

**What are the commonly held misconceptions about the disease?**

- That topical treatments will help in the management of tinea capitis. This is not the case as they merely reduce the symptoms. Oral antifungals should be used to treat tinea capitis successfully but there is also spontaneous resolution in many cases, although this usually takes many months.