

## **Fungal infection of the nails**

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The nails play an important role in our daily life. Not only do they protect the distal phalanges, but they can also be used to pick up small objects, play instruments, defend oneself, and above all as an object to enhance the beauty of the hands by the use of various nail varnishes.

However, there are many diseases that can afflict the nails causing them to become unsightly. Of those diseases, around 50% are due to fungal infections. On average, around 8 % of the population will be affected by a fungal infection of the nails, called Onychomycosis.

Onychomycosis is much more common in adults and can affect up to 80% of the geriatric population. The toe nails are more frequently involved and can lead to pain, discomfort, paraesthesia and loss of dexterity. Infection is most often caused by dermatophytes and rarely by moulds and yeast (see table1). The fungus gains access to the nail bed via the hyponychium [this is the area between the nail plate and the distal part of the finger (see picture1)]. At times, the infection can also begin from the nail folds. The organism then multiplies and cause damage to the nail plate. The nail can have yellow streaks, dark discoloration, whitish discoloration, and thickening. At a later stage, total damage to the nail plate ensues. Onychomycosis can persist for years and rarely ever gets cured without treatment. The infection can spread to other toes and with time all the nails can be affected. This can result in discomfort and loss of confidence.

There are many risk factors that make one more prone to developing such infections. Advancing age, family history, poor health, warm climates, HIV, Diabetes, use of communal baths and occlusive foot wares, are just some of them.

There are various methods to detect the organism. These include fungus detection by sending nail clippings to the laboratory, Polymerase chain reaction (not widely available) and the use of dermoscopy by dermatologists. Clinical diagnosis is most commonly used, bearing in mind that conditions like malignant melanoma, Lichen planus, Psoriasis, Eczema and trauma also commonly cause changes of the nail plates.

Treatment can be challenging as the nail grows slowly and receives very little blood supply. There is a better response with a combination of oral (see table 2) and topical agents. Thick nails can be chemically removed using urea or surgically avulsed. Laser beams can also penetrate the nail plate and kill the fungus. The Nd:Yag or Photodynamic therapy can be used, but more than one treatment is required. A combination of oral, topical and nail avulsion can increase the effectiveness of treatment and reduce costs.

Are there any ways to prevent the infection?

- It is impossible to prevent, but one can decrease the chance of getting it.
- Nail infections can be passed from person to person so washing of hands (and feet) after contact with infected people must be avoided.
- Do not go barefoot in public showers.
- Use antifungal spray or powder in shoes, esp. gym shoes.

- Manicure and pedicure instruments need to be properly sterilised.
- Keep feet dry and clean as possible.
- Keep finger and toe nails trimmed; do not pick or chew around nails.
- Avoid caustic skin agents by wearing gloves.
- Get treated early.

The cure rate is only 48%-75% with the finger nails having the best prognosis. However, most people will have some residual nail changes such as permanent discoloration of the nail plate. One should also be aware that the reinfection rate is as high as 50%, therefore regular check-up is mandatory.

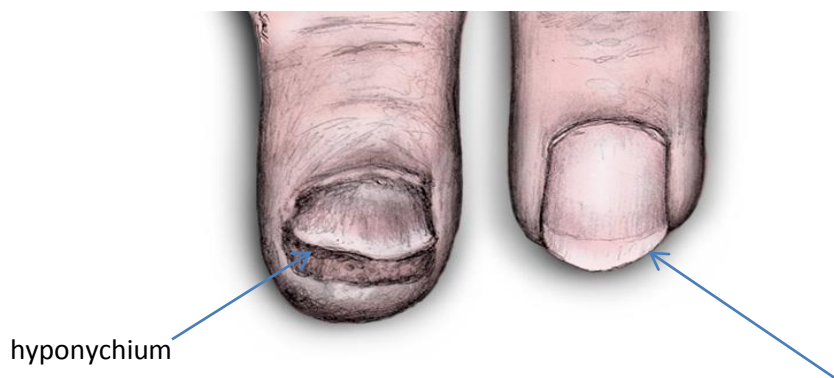
Table 1

- Dermatophytes
- **T Rubrum(70%)**
- **T Mentagrophytes(20%)**
- Moulds
- **Fusarium species**
- **Scopulariopsisbrevicaulis**
- **Aspergillus**
- Yeasts
- **Candida(rare)**

Table 2

- **Terbinafine**- inhibits squaleneepoxidase- leading to fungal cell death.
  - **Itraconazole**-slows fungal cell growth by inhibiting ergosterol-thus damaging the cell membrane
  - **Fluconazole**-Inhibits cell membrane of fungus
  - **Ciclopirox**- Interferes with synthesis of DNA of fungus
- (need to monitor liver function)

Picture 1



Nail plate

