

SPECIALITY: DERMATOLOGY

CLINICAL PROBLEM: FUNGAL NAIL INFECTION (ONYCHOMYCOSIS)

These notes should be used in conjunction with the flowchart at the end of this document

Introduction

Onychomycosis refers to fungal infection of the nails and is one of the commonest dermatological conditions possibly affecting up to 10% of the population.¹ It is more commonly found in toenails (five times more likely) than finger nails.^{2,3}

Many people with a long-standing fungal infection of their toenails have no symptoms apart from a change in appearance of the nail characterised by nail thickening and discolouration. In these patients it may be entirely appropriate not to treat in order to avoid the additional complications associated with systemic therapy.⁴

The purpose of this guidance is to identify the patients in whom treatment is appropriate and the recommended course of action.

Causative organism

Onychomycosis is an infection of the nail apparatus by fungi that include dermatophytes (responsible for 90% of fungal nail infections) non-dermatophyte moulds and yeasts (mainly candida).¹ Candida infections mainly affect the finger nails.²

Symptoms

There are different presentations of onychomycosis depending on the infective organism, and each requiring a slightly different treatment course.

Distal and lateral subungual onychomycosis (DLSO)

- Majority of cases
- Affects the nail bed (starting at the free end of the nail)
- Almost exclusively dermatophyte in origin
- Results in nail thickening, creamy/yellow discolouration and separation of the nail from the nail bed

Superficial white onychomycosis (SWO)

- Affects the surface of the nail
- Dermatophyte in origin
- White discolouration
- Noticeable flaking

Proximal subungual onychomycosis (PSO)

- Uncommon
- No inflammation of surrounding skin
- Often related to intercurrent disease which may need further investigation e.g.HIV
- Dermatophyte in origin

Candidal Onychomycosis

- Chronic inflammation of surrounding skin
- Nail infection
- Secondary candidiasis
- Uncommon

Mould Onychomycosis

- Occasionally onychomycosis may be caused by moulds such as: Aspergillus, Scopulariopsis, Fusarium, Acremonium
- Moulds may sometimes show as contaminants in samples.
- Success of treatment is small and reinfection is high

Investigation

Treatment should not be started on clinical grounds alone.¹ When fungal infection is suspected, specimens for confirmation of the diagnosis should be obtained before treatment is started in order to optimise the treatment.²

It is estimated that only 50% of nail changes are due to fungal infection¹, and many other dermatological conditions mimic fungal infection which often accounts for the failure of treatment.²

The consensus is that investigation of the causative organism and initiation of treatment should only be done in:

- at risk patients
- those with poor or diminished circulation e.g. in diabetics or those with peripheral vascular disease
- those for whom the infection is causing mechanical problems
- immunocompromised patients who are at risk of the infection developing into an invasive form.⁴

Laboratory diagnosis consists of microscopy to visualise fungal elements in the nail sample and culture to identify the species. Dermatophyte onychomycosis is primarily a disease of the nailbed rather than the nailplate.¹

For samples that show any of the moulds listed under mould onychomycosis a repeat test must be performed as they may just be contaminants in the sample and should therefore not be treated.

In the laboratory the whole of the specimen is examined by microscopy after the addition of 20% potassium hydroxide. The material is then cultured using agar plates which help to identify non-dermatophyte organisms. These cultures can take up to 3 weeks due to the slow growth of dermatophytes.¹

Collecting samples for microscopy

- A dental scraper should be used to scrape material from the underside of the nail and the nail bed from the most proximal part of the nail which yields the best results (the nail may be cut back if necessary, heavy duty nail clippers may be required).
- For SWO the surface of the nail should be scraped
- Submit as much material as possible
- Samples should be put onto black card so that they are clearly visible
- Ensure all samples are clearly labelled with: the date the sample was taken; area from which the sample was taken; patient details; who has taken the sample, GP/department & address/reference
- Send the clearly labelled sample for analysis
- Advise patients that results will take at least 3 weeks

Treatment

Before commencing treatment, nail reduction where possible may improve the efficacy of therapy.

See algorithm for treatment guidelines.

In the event of treatment failure the patient should be referred to the specialist dermatologist. Please ensure that a copy of the results are sent with the referral.

As results from scrapings take 3 weeks it is unlikely that treatment will be initiated in the secondary care setting.

References

¹Roberts DT, Taylor WD, Boyle J. Guidelines for treatment of onychomycosis. British Journal of Dermatology 2003; 148: p 402 – 410.

²Denning DW, Evans EGV, Kibbler CC, Richardson MD. Fungal nail disease: A guide to good practice (report of a Working Group of the British Society for Medical Mycology). British Medical Journal (International Edition). London Nov 11 1995; Vol 311: Issue 7015; p 1277

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[http:// www.proquest.umi.com](http://www.proquest.umi.com)

³Janknegt R, Bessems PJMJ, Dekker SK, van Tiel F. Antimycotics in toenail onychomycosis. Drug selection by means of the SOJA method. Journal of Drug Assessment 2003; 6: S1 – S18

⁴ Prodigy Guidance – fungal (dermatophyte) infections – skin and nails. Available from URL:

<http://www.prodigy.nhs.uk/guidance>

⁵British Medical Association, Royal Pharmaceutical Society of Great Britain. British National Formulary (50). 50th Ed. Wallingford: Pharmaceutical Press; September 2005

⁶Specific Product Characteristics. Lamisil[®]. Available from: URL:

<http://www.emc.medicines.org.uk/emc>

⁷Specific Product Characteristics. Loceryl[®]. Available from: URL:

<http://www.emc.medicines.org.uk/emc>

⁸Specific Product Characteristics. Sporanox - pulse[®]. Available from: URL:

<http://www.emc.medicines.org.uk/emc>

Additional Information on Treatment for Onychomycosis for Adults^{5,6,7,8}

Drug / Dose	Cautions	Adverse Drug Reactions	Monitoring	Counselling Points
<p>Terbinafine 250mg Tablets 250mg once daily for 6 weeks to 3 months (fingernails)</p> <p>250mg daily for 3 months (toenails – longer than 3 months may be required)</p>	<p>Hepatic impairment Renal impairment Pregnancy Breastfeeding</p>	<p>GI (nausea, vomiting, diarrhoea, dyspepsia, abdominal pain) Rarely liver abnormalities (hepatitis, jaundice, cholestasis), dizziness, malaise, rash, urticaria, pruritis, taste disturbance, headache, blood disorders (leucopenia, thrombocytopenia)</p>	<ul style="list-style-type: none"> ▪LFT's ▪FBC's 	<ul style="list-style-type: none"> ▪With <u>or</u> without food
<p>Itraconazole 100mg capsules 200mg twice a day for 7 days</p> <p><u>Finger nails</u> Repeat course after 21 days</p> <p><u>Toe nails</u> Repeat course twice, allow 21 days between each course</p>	<p>Hepatotoxicity Acute Liver disorder Cardiac disease Negative inotropic drugs Pregnancy Breastfeeding</p>	<p>Rarely GI (nausea, vomiting, diarrhoea, dyspepsia, abdominal pain), Hepatotoxicity (jaundice, hepatitis), heart failure, headache, peripheral neuropathy, menstrual disorders, hypokalaemia, rashes, pruritis and alopecia</p>	<ul style="list-style-type: none"> ▪Monitor liver function ▪Monitor levels in immunocompromised ▪Renal function <p>* Large number of drug interactions - check before prescribing *</p>	<ul style="list-style-type: none"> ▪<u>With</u> food, (1-2 hours before antacids) ▪Patients should be told how to recognise signs of liver disease, and advised to seek medical attention if symptoms such as anorexia, nausea & vomiting, fatigue, abdominal pain or dark urine develop.
<p>Amorolfine Apply to the affected nail once weekly</p>	<p>Pregnancy Breastfeeding</p>	<p>Slight burning sensation in area of application. Nail discolouration, broken and brittle nails</p>	<p>Ensure lunula of nail is free from mycosis when amorolfine used alone for increased rate of success</p>	<ul style="list-style-type: none"> ▪May experience burning sensation if severe seek advice ▪Nail discolouration

