Volume 171 | Number 5 | November 2014

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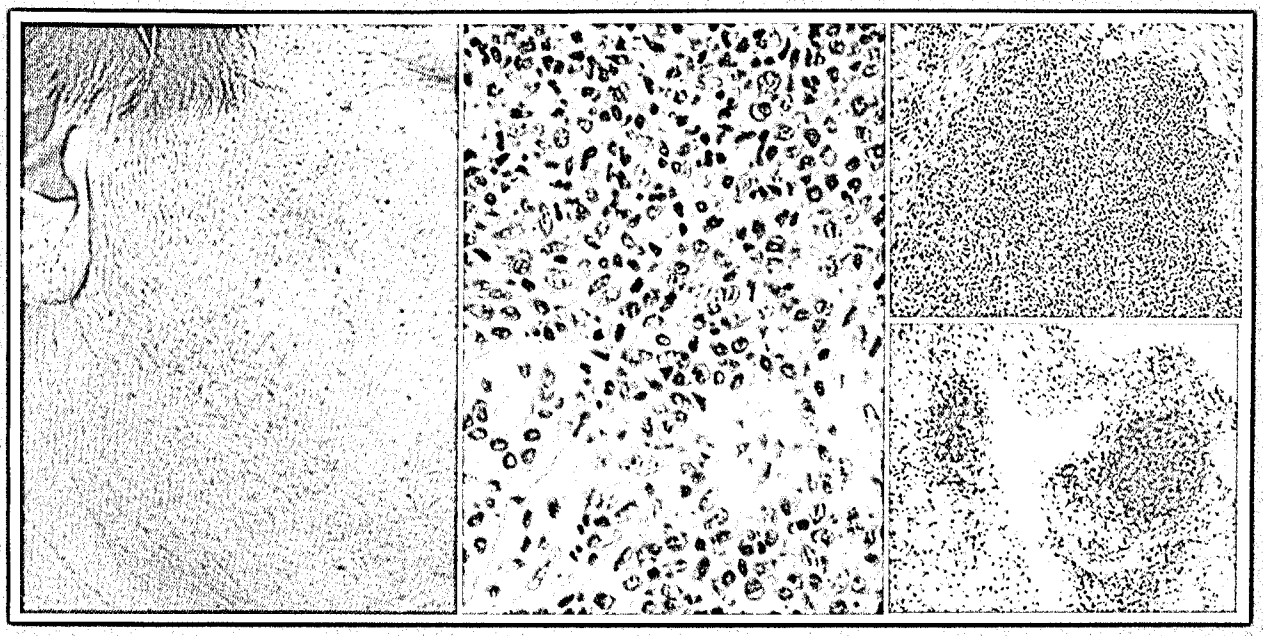
British Journal of Dermatology

OFFICIAL JOURNAL OF THE BRITISH ASSOCIATION OF DERMATOLOGISTS



Review Article

Skin manifestations of IgG4-related skin disease (p 959)

Review Article

Utility of radiotherapy for skin cancer (p 968)

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BJD invites submissions under a broad scope of topics relevant to clinical and experimental research and publishes original articles, reviews, concise communications, case reports and items of correspondence. The article categories within the journal are: cutaneous biology; clinical and laboratory investigations; contact dermatitis & allergy; dermatological surgery & lasers; dermatopathology; epidemiology & health services research; paediatric dermatology; photobiology; and therapeutics.

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BRITISH JOURNAL OF DERMATOLOGY (ISSN 0007-0963) is published monthly. US mailing agent: Mercury Media Processing, LLC, 1850 Elizabeth Avenue, Suite #C, Rahway, NJ 07065 USA. Periodicals postage paid at Rahway, NJ. Postmaster: send all address changes to *British Journal of Dermatology*, John Wiley & Sons Inc., C/O The Sheridan Press, PO Box 465, Hanover, PA 17331, USA.

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BJD is published on behalf of the British Association of Dermatologists by John Wiley & Sons Ltd., 9600 Garsington Road, Oxford, OX4 2DQ, UK. Tel: +44 1865 776868; Fax: +44 1865 714591; Web: www.wiley.com

ISSN 0007-0963 (print)
ISSN 1365-2133 (online)

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British Journal of Dermatology

Volume 171, Number 5, November 2014

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Pseudolymphoma. Br J Dermatol **171**: 959–67.

BJD
British Journal of Dermatology

British Association of Dermatologists' guidelines for the management of onychomycosis 2014

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Accepted for publication
21 July 2014

Funding sources
None.

Conflicts of interest
J.T.L. has acted as a consultant for Novartis (nonspecific); M.R. has acted as a consultant for Reckitt Benckiser (specific).

The authors are listed in alphabetical order.

M.A., J.T.L., V.M. and M.R. are members of the guideline development group, with technical support provided by M.F.M.M.

This is an updated guideline prepared for the British Association of Dermatologists (BAD) Clinical Standards Unit, which includes the Therapy & Guidelines (T&G) Subcommittee. Members of the Clinical Standards Unit who have been involved are J.R. Hughes (Chairman T&G), A. Sahota, M. Griffiths, A.J. McDonagh, S. Punjabi, D.A. Buckley, I. Nasr, V.J. Swale, C.E. Duarte Williamson, P.M. McHenry, N.J. Levell, T. Leslie, E. Mallon, K. Towers (British National Formulary), R. Davis (British Dermatological Nursing Group), C. Saunders (British Dermatological Nursing Group), S.E. Haveron (BAD Scientific Administrator), L.S. Exton (BAD Information Scientist) and M.F. Mohd Mustapa (BAD Clinical Standards Manager).

Produced in 2003 by the British Association of Dermatologists; reviewed and updated 2014

DOI 10.1111/bjd.13358

1.0 Purpose and scope

The overall objective of the guideline is to provide up-to-date, evidence-based recommendations for the management of onychomycosis. The document aims to (i) offer an appraisal of all relevant literature since January 2002, focusing on any key developments; (ii) address important, practical clinical questions relating to the primary guideline objective, for example accurate diagnosis and identification of cases, and suitable treatment to minimize the duration of disease and discomfort; (iii) provide guideline recommendations and, where appropriate, with some health economic implications; and (iv) discuss potential developments and future directions.

The guideline is presented as a detailed review with highlighted recommendations for practical use in the clinic, in addition to an updated patient information leaflet [available on the British Association of Dermatologists' (BAD) website, www.bad.org.uk].

2.0 Stakeholder involvement and peer review

The guideline development group consisted of consultant dermatologists and a consultant mycologist. The draft document was circulated to the BAD membership, the British Dermatological Nursing Group, the Primary Care Dermatological Society and the North West Region Kidney Patient Association for comments, and was peer reviewed by the Clinical Standards Unit of the BAD (made up of the Therapy & Guidelines Subcommittee) prior to publication.

3.0 Methodology

This set of guidelines has been developed using the BAD's recommended methodology[1] and with reference to the Appraisal of Guidelines Research and Evaluation (AGREE II) instrument (www.agreetrust.org).[2] Recommendations were developed for implementation in the National Health Service using a process of considered judgement based on the evidence. The PubMed, Medline and Embase databases were searched for meta-analyses, randomized and nonrandomized controlled clinical trials, case series, case reports and open studies involving onychomycosis published in the English language from January 2002

to February 2014; search terms and strategies are detailed in Data S1 (see Supporting Information). Additional relevant references were also isolated from citations in the reviewed literature, as well as from additional, independent targeted literature searches carried out by the coauthors. The preliminary results were split into four, with each consultant coauthor screening the identified titles; those relevant for first-round inclusion were selected for further scrutiny. The abstracts for the shortlisted references were then reviewed and the full papers of relevant material were obtained. The structure of the guidelines was then discussed and different coauthors were allocated separate subsections. Each coauthor then performed a detailed appraisal of the relevant literature, and all subsections were subsequently collated and edited to produce the final guidelines.

4.0 Limitations of the guideline

This document has been prepared on behalf of the BAD and is based on the best data available when the document was prepared. It is recognized that under certain conditions it may be necessary to deviate from the guidelines and that the results of future studies may require some of the recommendations herein to be changed. Failure to adhere to these guidelines should not necessarily be considered negligent, nor should adherence to these recommendations constitute a defence against a claim of negligence. Limiting the review to English language references was a pragmatic decision but the authors recognize that this may exclude some important information published in other languages.

5.0 Plans for guideline revision

The proposed revision for this set of recommendations is scheduled for 2019; where necessary, important interim changes will be updated on the BAD website.

6.0 Background

6.1 Definition

The term tinea unguium is used to describe dermatophyte infections of the fingernails or toenails.[3–5] Onychomycosis is a less specific term used to describe fungal disease of the nails. The condition is worldwide in distribution. In addition to dermatophytes, it can be caused by a number of other moulds and by *Candida* species. Some of the contributing factors causing this disease are occlusive footwear, repeated nail trauma, genetic predisposition and concurrent disease, such as diabetes, poor peripheral circulation and HIV infection, as well as other forms of immunosuppression.

There is wide geographical and racial variation in the aetiological agents of onychomycosis, but in the U.K. 85–90% of nail infections are due to dermatophytes and about 5% are due to nondermatophyte moulds.[4–6] The most commonly implicated dermatophyte is the anthropophilic species *Trichophyton rubrum*, followed by *Trichophyton interdigitale*. Zoophilic species are seldom involved, and usually only in fingernail infections.

6.2 Epidemiology

Onychomycosis is among the most common nail disorders in adults, accounting for 15–40% of all nail diseases.[7] Onychomycosis is most prevalent in older adults but, because of the limited number of large-scale studies, the actual incidence of the condition is difficult to assess. Moreover, many reports do not distinguish between dermatophytosis and other forms of onychomycosis, or between infections of the fingernails and toenails. It has been estimated that onychomycosis occurs in about 3% of the adult population in the U.K.[8]

6.3 Aetiology

Many risk factors for onychomycosis have been identified. They include increasing age, peripheral vascular disease, trauma and hyperhidrosis. Fungal nail disease is more prevalent in men and in individuals with other nail problems such as psoriasis, in persons with immunosuppressive conditions such as diabetes mellitus or HIV infection, and in those taking immunosuppressive medications. Tinea unguium is associated with tinea pedis in up to one-third of cases. The difference between the incidence of onychomycosis in men and women might be a reflection of the degree to which individuals are concerned about the appearance of their nails. Likewise, the higher incidence of onychomycosis in older individuals could be due to the greater likelihood of younger patients seeking treatment at an earlier stage. Although infrequent, onychomycosis can affect children and is most likely due to the wearing of occlusive footwear.

6.3.1 Onychomycosis in children

There are few reports studying the aetiology of onychomycosis in children. A recent study from Spain illustrates the spectrum of causal agents and disease patterns.[9] To study childhood dermatophyte onychomycosis, a retrospective study was carried out of children < 16 years of age, with dermatophyte onychomycosis diagnosed between 1987 and 2007. Of 4622 nail samples from 3550 patients, 218 came from 181 children up to 16 years old. Onychomycosis caused by dermatophytes was demonstrated in 28 cases (15·5%). *T. rubrum* (18 cases) was the most prevalent species, followed by *T. tonsurans* (five cases), *T. mentagrophytes* var. *interdigitale* (four cases) and *T. mentagrophytes* var. *mentagrophytes* (one case). Concomitant dermatophytosis at other locations was confirmed in seven cases (25%). Toenail onychomycosis was associated with tinea pedis in five cases. Distal and lateral subungual onychomycosis was the most common clinical pattern. The superficial white type was found in two cases of toenail onychomycosis caused by *T. rubrum* and *T. tonsurans*. During the period of study, only 5·1% of all investigated people were children aged up to

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