Superficial Mycoses: Perspectives and Diagnostic Challenges

Sandra Widaty

Dept. Dermatology and Venereology

Fac. of Medicine Universitas Indonesia – Cipto Mangunkusumo Hospital.

Jakarta Indonesia

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Superficial Mycoses

- Global scale - major challenges associated with superficial fungal infections (SFIs) of the skin and mucosa membrane : their extremely high **prevalence** (19 % population) with the considerable proportions of patients with chronic infections.
- SFIs:
- Superficial dermatophytoses characterized by:
  - a slow but persistent progression of infection,
  - virulence factors (adhesion factors and the production of keratinase and proteinases) contribute to tissue damage
- Yeast: *Candida* and *Malassezia* – **colonizers** – significant percentage of people – could be the cause of SFIs
- SFIs caused by **non-dermatophytic molds** have been reported more frequent in recent years

Treatment challenges

- **Antifungal limited** - fungal susceptibility differs in vivo and in vitro - satisfactory in vitro susceptibility does not guarantee successful treatment, whereas in vitro resistance indicates likely ineffectiveness in vivo.
- **The need for official treatment guidelines** for these fungal infections and **mandatory mycological analyses**, including antifungal susceptibility testing, particularly in cases of chronic or recurrent disease.

Mycological diagnostic challenges

- Lack of implementation of microbial examination: lengthy duration of conventional analyses and prize
- Need a rapid and accurate detection of potential causative agents within an optimal timeframe
- The development and establishment of prompt, precise tests with high sensitivity and specificity : **immunochromatographic 'point-of-care' assays and molecular techniques**.
- Challenges: **not readily available**

Several tests

- Euro Array Dermatomycosis Platform Assay
- The Dermoscopy and Ultraviolet-enhanced Fluorescence Dermoscopy (UEFD) – For Kerion Celsi: detection of perifollicular celadon green fluorescence: a non-invasive, fast, easy-to-use diagnostic procedure that provides the diagnosis of fungal infections

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ORIGINAL ARTICLE

mycoses | WILEY

Prognostic factors influencing the treatment outcome of onychomycosis Candida

Sandra Widaty[1] | Eliza Miranda[1] | Kusmarinah Bramono[1] | Sri Linuwih Menaldi[1] | Melani Marissa[1] | Caroline Oktarina[1] | Danny Surya[1] | Hening Tirta Kusumawardhani[2]

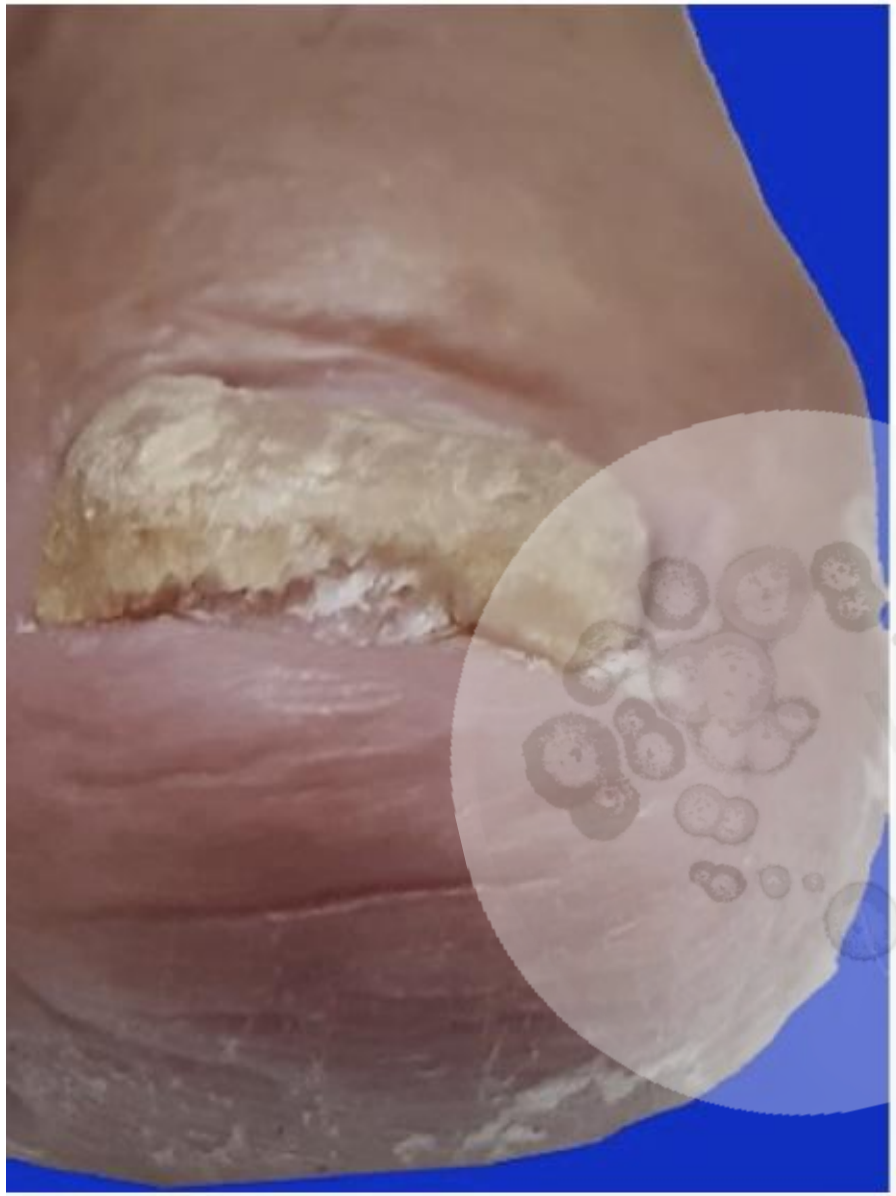
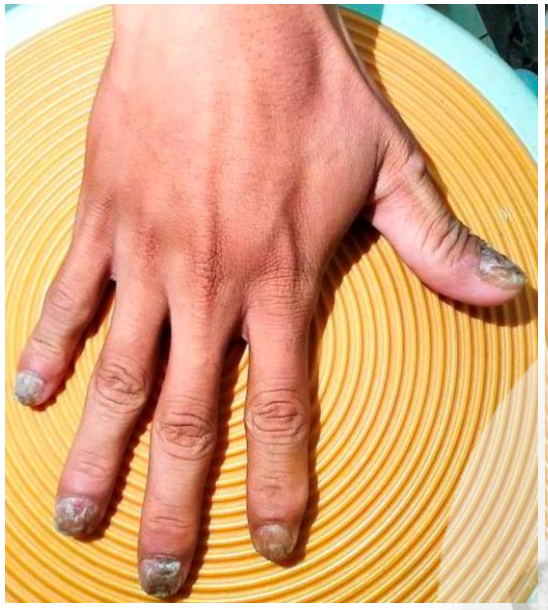


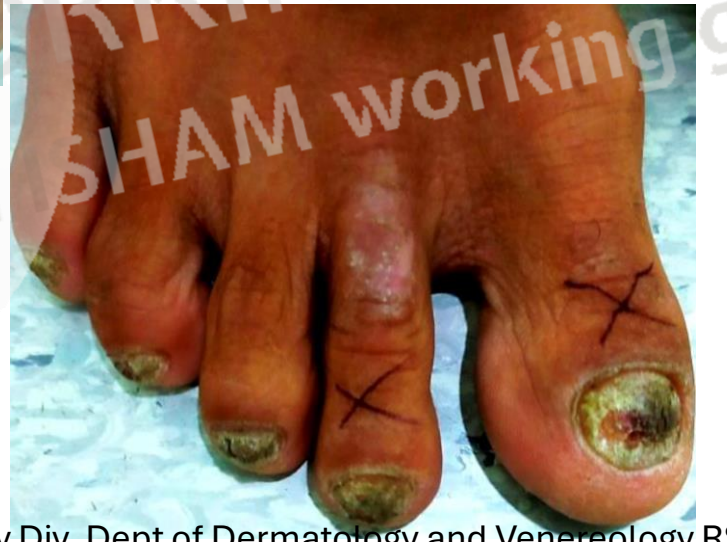
TABLE 1 Sociodemographic characteristics of onychomycosis Candida patients at Dr. Cipto Mangunkusumo National General Hospital in 2012-2018 and odds ratio against mycological cure (number of patients = 54)

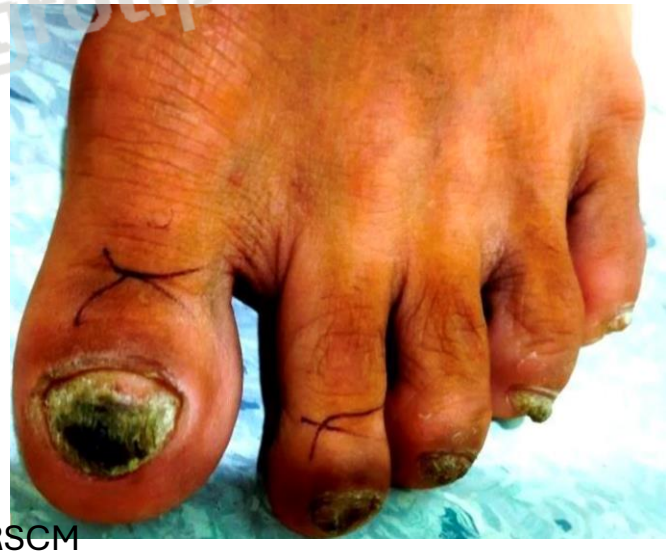
Variable	Mycological cure				p value	Odds ratio	95% confidence interval	p value
	Cured		Not cured					
	n	%	n	%				
Gender								
Male	1	5.88	13	35.14	0.023*	0.83	0.42-1.64	0.159
Female	16	94.12	24	64.86				
Age								
Children (<18 years old)	1	5.88	1	2.7	0.047*	1.46	1.07-2.03	0.018*
Adult (18-60 years old)	11	64.71	12	32.43				
Elderly (>60 years old)	5	29.41	24	64.86				
Onset of disease								
<6 months	9	52.94	14	37.84	0.778	1.14	1.11-1.17	0.001*
6-12 months	4	23.53	11	29.73				
>1-5 years	3	17.65	9	24.32				
>5 years	1	5.88	3	8.11				
Comorbidities								
None	9	52. 94	5	13.51	0.013*	1.07	1.03-1.11	0.002*
Endocrine diseases	0	0.00	6	16.22				
Malignancies	0	0.00	3	8.11				
Cardiovascular diseases	2	11.76	0	0.00				
Autoimmune diseases	0	0.00	5	13.51				
Infection	1	5.88	2	5.41				
Other skin disorders	3	17.65	9	24.32				
HIV/AIDS	0	0.00	3	8.11				
Other systemic diseases	2	11.76	4	10.81				

Clinical diagnostic challenges: Onychomycosis Candida

Twenty nail dystrophic







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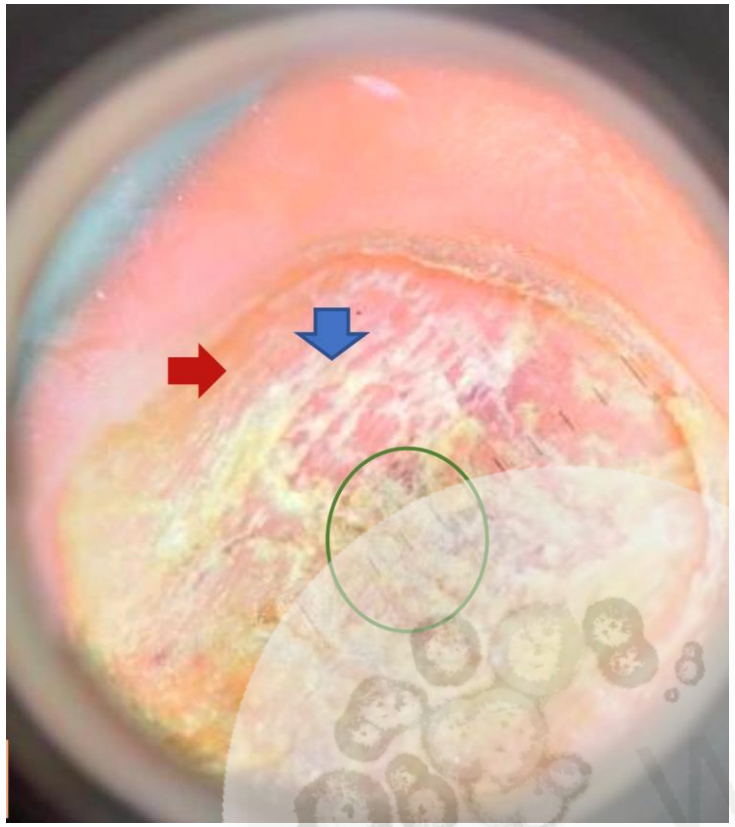

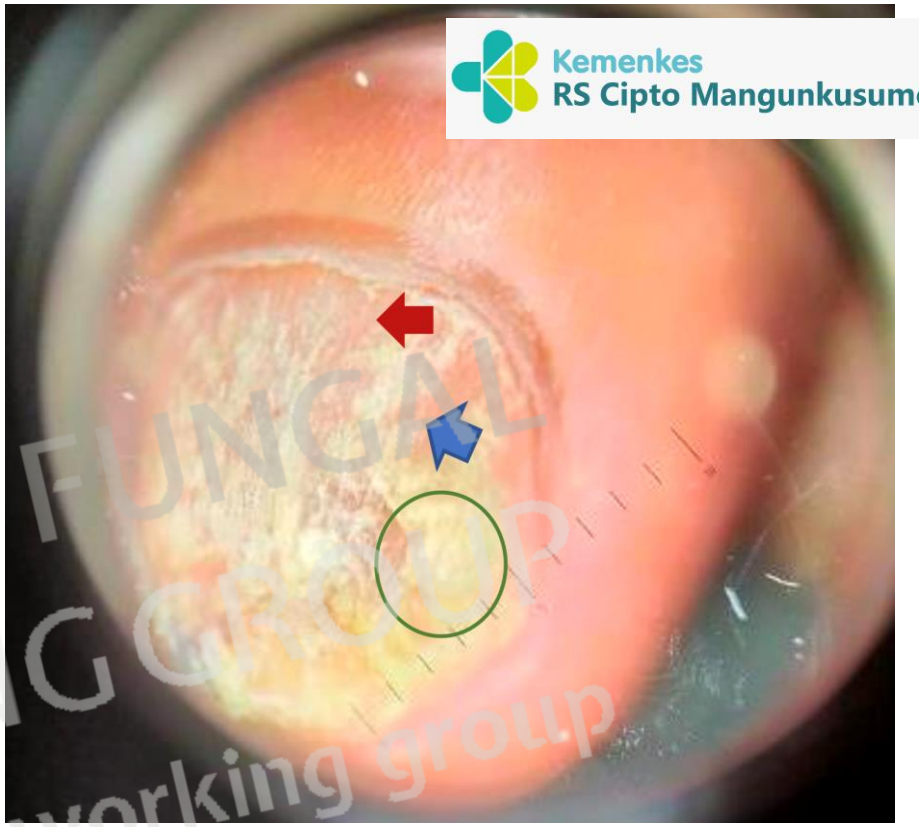

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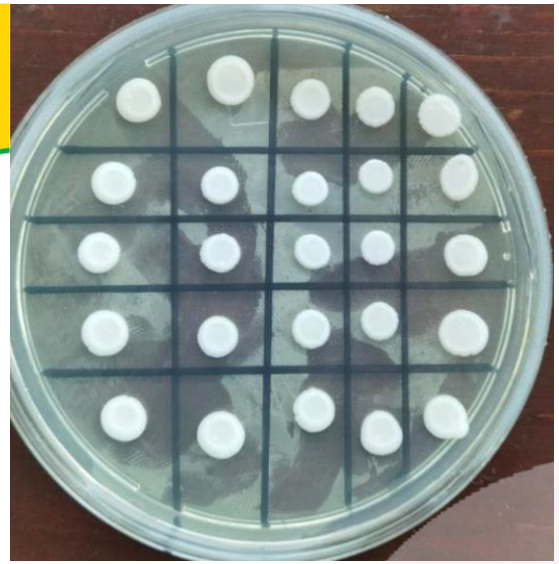
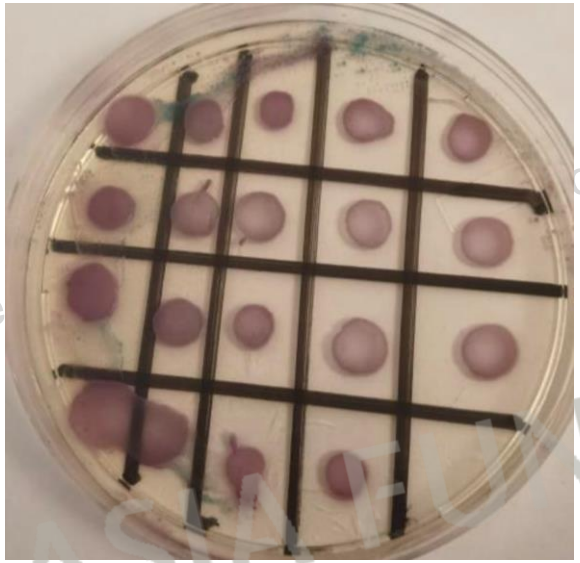
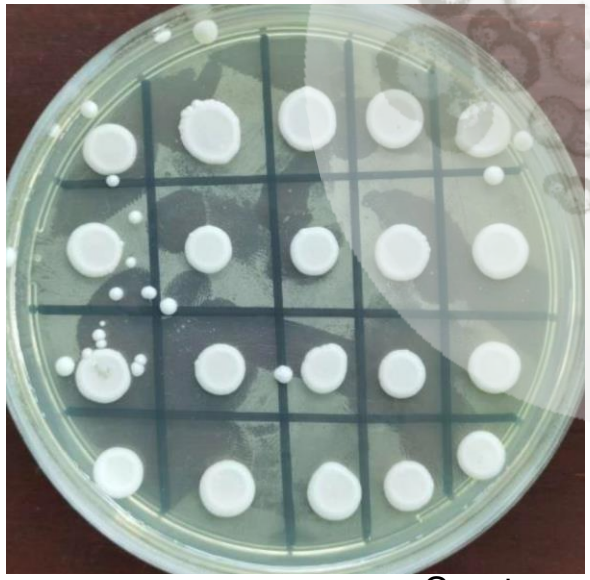


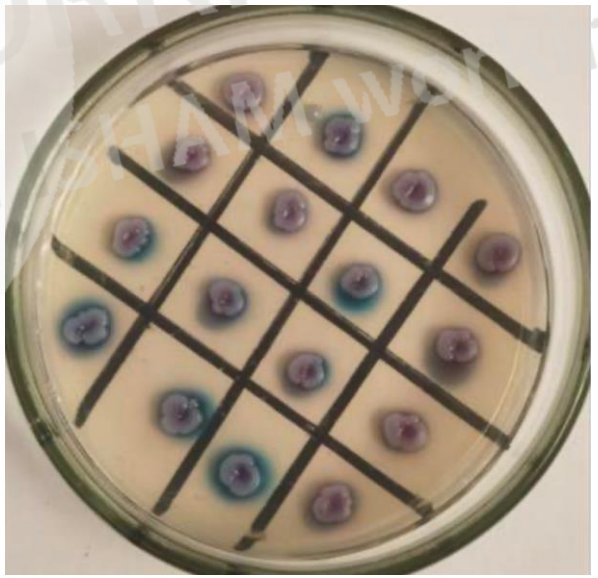
Hand: Sabouraud Agar & Sicloheximide– 20 inocula



Media: Chrom Agar - violaceous

Foot: *C. Glabrata*





Hand : *C. Glabrata*

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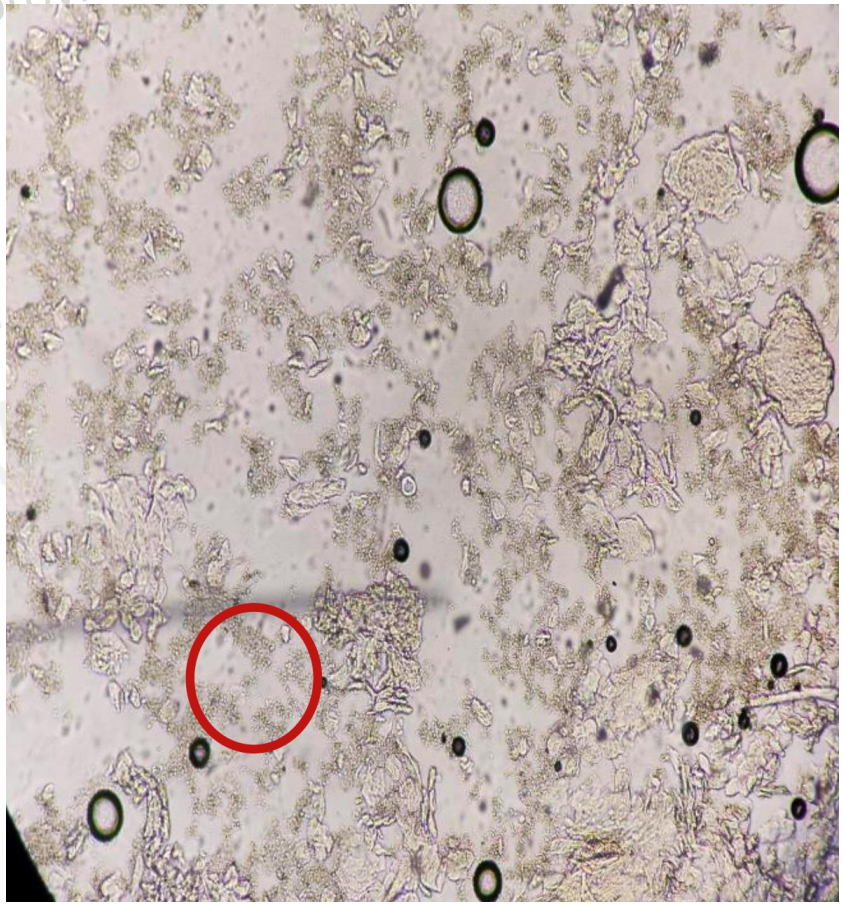
:

OSI Score : 35 (*severe onychomicosis*)

Culture: *Candida Glabrata*

Resistance Test: Itraconazole, miconazole, ketoconazole and fluconazole: sensitive
Treatment: Itraconazole pulse dose (2x200 mg/day - 1 week, 4-6 months),



Microscopic Examination KOH – Spore, blastospores, pseudohyphae

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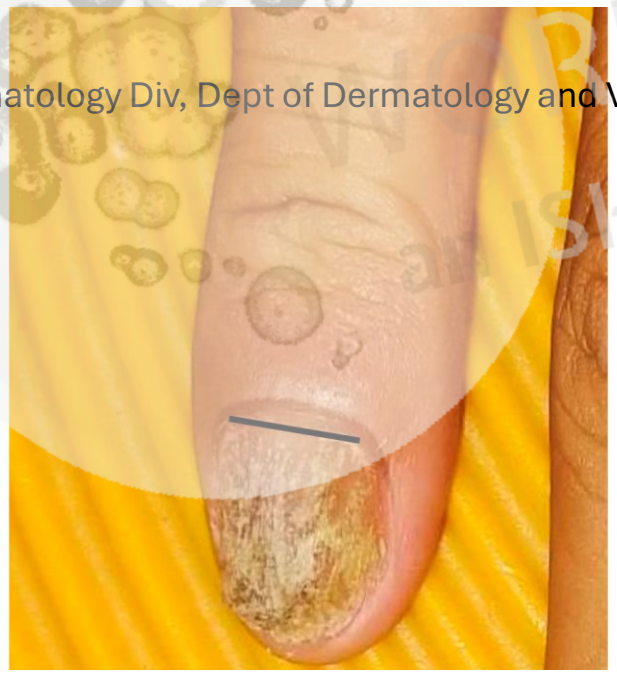
Kemenkes
RS Cipto Mangunkusumo

Follow up: Nail digiti 4: week 0 (A), week 3 (B) and 5 (C)



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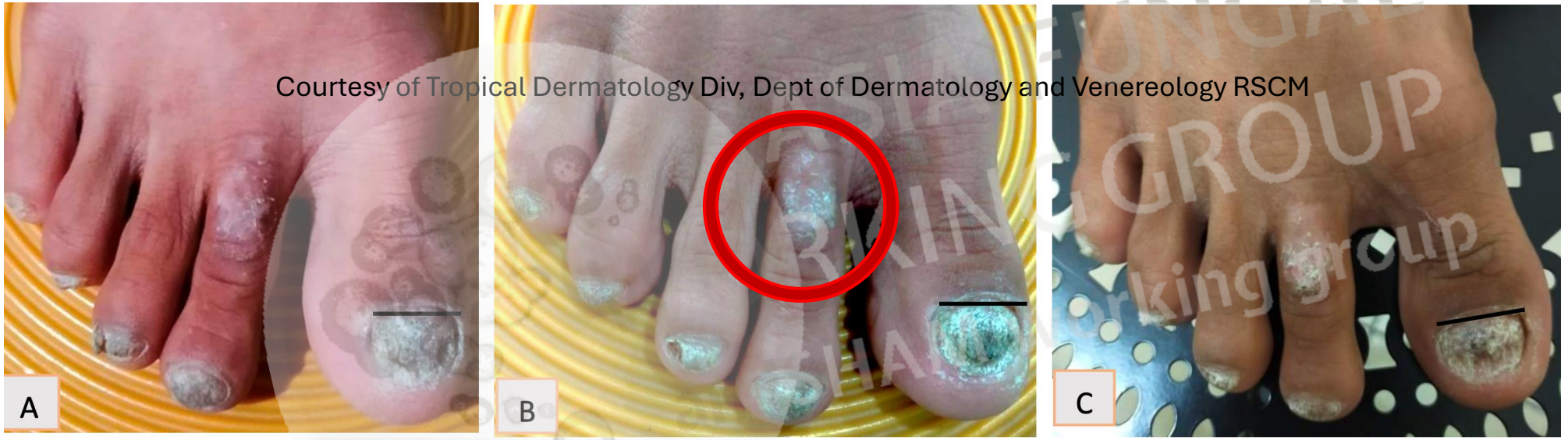
Follow up: Nail digiti 4: week 0 (A), week 3 (B) and 5 (C)
Minimal improvement



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Follow up: Weeks : 0 – 3 and 5, Minimal improvement,

Clinical Research

Clinical and microbiological characteristics of onychomycosis in a tertiary hospital: a cross-sectional study

Sandra Widaty[1,2], Caroline Oktarina[1,2], Melani Marissa[1,2], Robiatul Adawiyah[3,4], Anna Rozaliyani[3], Emiliana Kartika[1], Mulyati Tugiran[3]

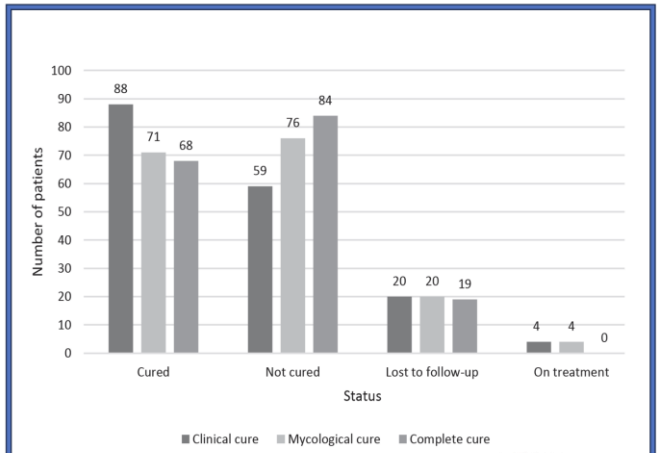


Figure 1. Clinical outcome of the patients

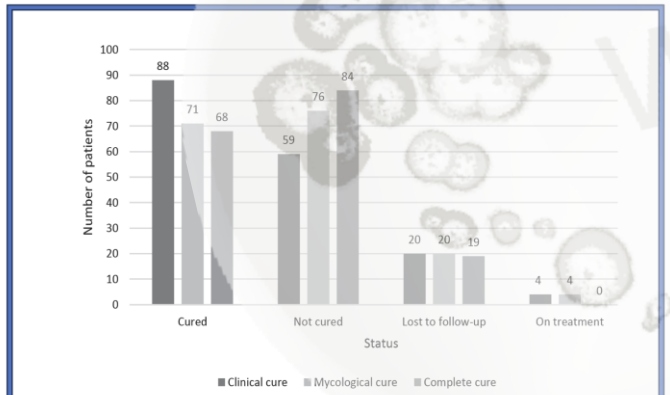


Figure 1. Clinical outcome of the patients

Medical Journal of **Indonesia**

Table 2. Laboratory findings in patients with onychomycosis

Laboratory findings	n (%) (N = 171)
Direct microscopic examination with KOH (n = 171)	
Blastospore	158 (92.4)
Yeasts	7 (4.1)
Hyphae	3 (1.8)
None	3 (1.8)
Number of colonies (n = 60)	
None	12 (20.0)
10 colonies	6 (10.0)
15 colonies	2 (3.3)
20 colonies	40 (66.7)
Culture result (n = 62)	
C. albicans	29 (48.3)
C. parapsilosis	8 (13.3)
Fusarium	4 (6.7)
C. glabrata	3 (5.0)
Trichosporon sp.	3 (5.0)
C. tropicalis	1 (1.7)
Rhodotorula sp.	1 (1.7)*
C. dubliniensis	1 (1.7)†
None	12 (20.0)
Antifungal sensitivity test (n = 44)	
Fluconazole	44 (100.0)
Ketoconazole	44 (100.0)
Miconazole	42 (95.5)
Itraconazole	39 (88.6)

**Rhodotorula* was identified with *C. parapsilosis* in one patient;
†*C. dubliniensis* was identified with *C. albicans* in one patient

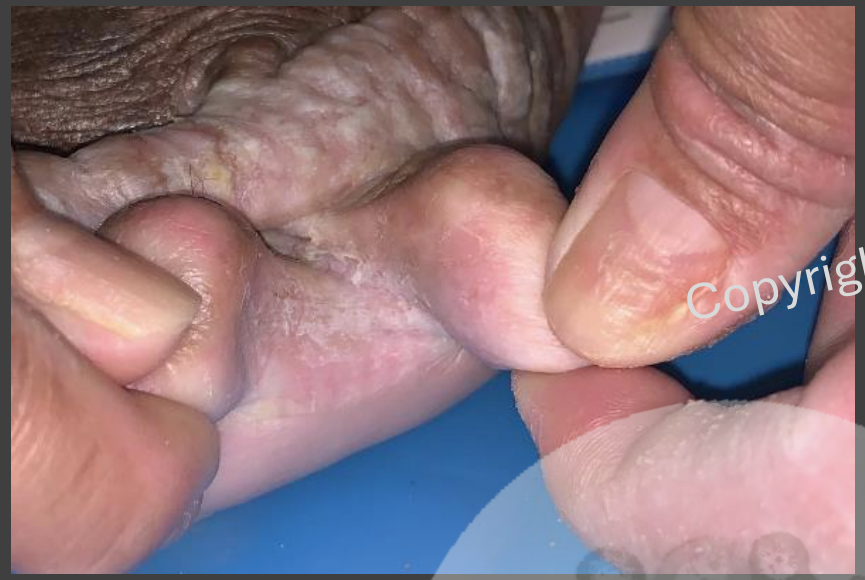
Clinical diagnostic challenges: Non-Dermatophyte Molds Dermatomycosis

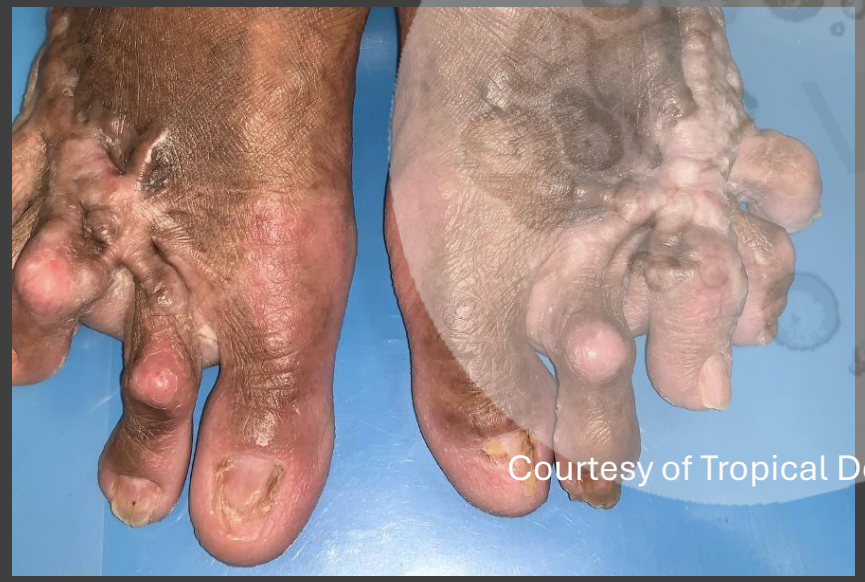
- Skin infections can be primary;
- The most common risk factor for non-dermatophyte mold infection is damage to intact skin: extensive burns
- Etiology: *Aspergillus flavus and Aspergillus niger* complexes, *Fusarium sp, Penicillium sp*
- In immunocompromised patients: skin infected with these fungi can be a source of fungemia, resulting in the dissemination of pathogens and the development of **invasive fungal infections (IFIs)**

Dermatomycosis ec *Fusarium sp and Aspergillus sp*

- Pts:
- 1. Tinea pedis (?)et causa *Aspergillus flavus*
- 2. Onychomycosis et causa *Fusarium sp.*
- 3. A(hypo)myopathic dermatomyositis dd/ overlap with systemic sclerosis
- 4. Contact allergy dermatitis ec latex dd/ ec detergent
- 5. Stasis Dermatitis in chronic venous insufficiency
- 6. Anemia

- Interdigital pedis bilateral I-V: white patch and maseration,
- Nail (digiti I-III and V) bilateral: onychodystrophic, subungual hyperkeratosis, yellow discoloration
- Onychomycosis severity index: 35 (severe)
- Laboratory examination: **Interdigitalis : KOH**: **true hyphae, Culture: *Aspergillus flavus*** / *A. Tamarii* . Resistance test: sensitive to Itraconazole and terbinafine
- Nail: KOH - **blastospores, pseudohyphae, true hyphae,** Culture**: *Fusarium sp***. Resistance test: *NA*





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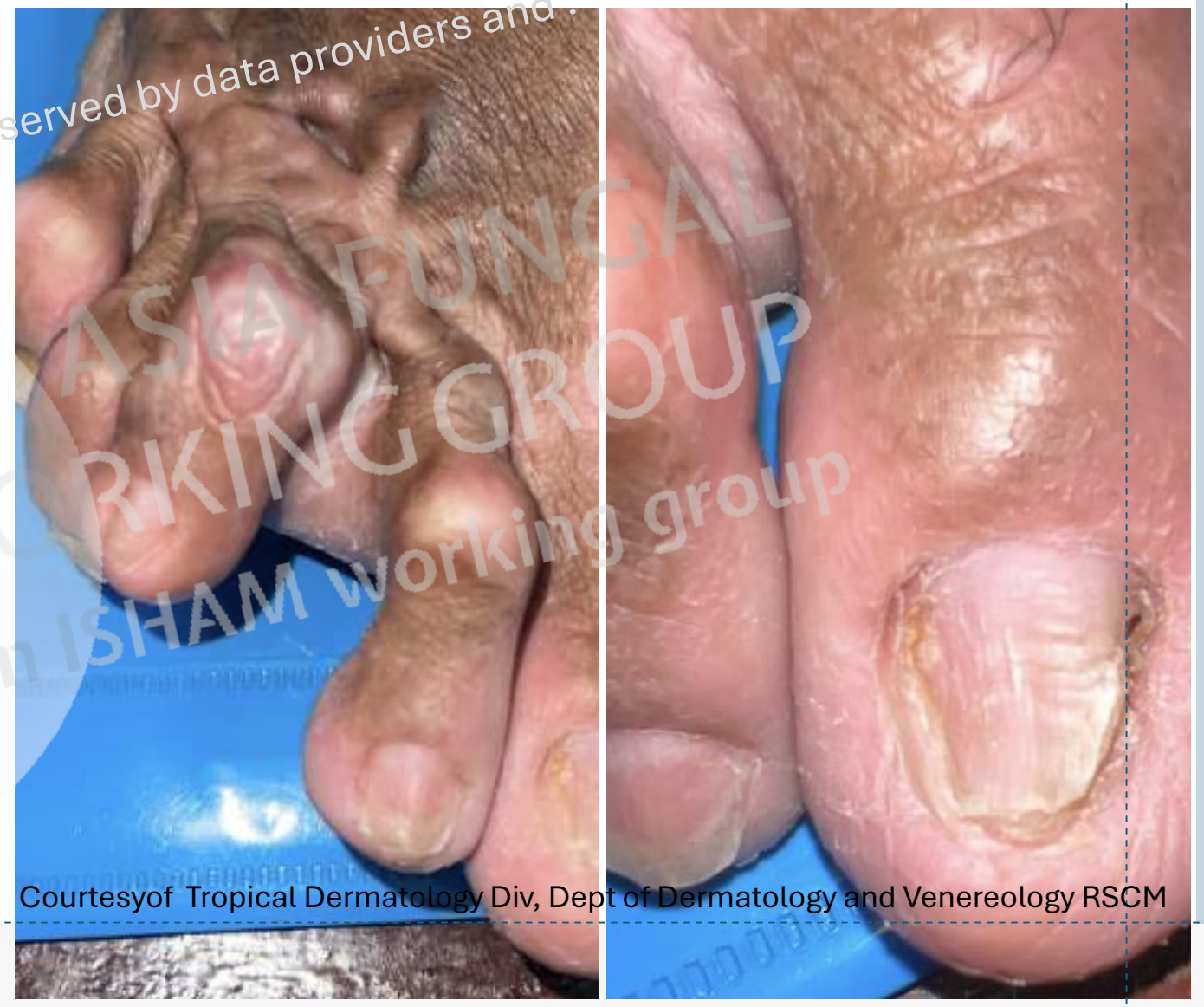
Follow up:

- Treatment: Terbinafine 250 mg (14 days) – Terbinafine 500 mg (7 days/m for 3-6 months)
- Ketoconazole cream
- Result:
- **Interdigital – lesion cleared and KOH negative (2 weeks)**



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Article PDF Available

Cutaneous Aspergilosis Caused by Aspergillus Flavus: A Case Report

March 2021 · Berkala Ilmu Kesehatan Kulit dan Kelamin 33(1):72
DOI:10.20473/bikk.V33.1.2021.72-77

Authors:

Maria Ulfa Sheilaadji
Indropo Agusni
Linda Astari
Airlangga University
Sylvia Anggraeni

Show all 6 authors

Abstract

Background: Cutaneous aspergillosis occurs relatively less frequent and therefore remains poorly characterized. Cutaneous aspergillosis can be as primary or secondary infection. Primary cutaneous aspergillosis usually involves sites of skin injury, intravenous catheter, traumatic inoculation, and associated with occlusive dressings. Secondary lesions result from contiguous extension from infected underlying structures or from widespread blood-borne seeding of the skin. Purpose: To know the skin manifestation, efflorence, examination and therapy of cutaneous aspergillosis. Case: A man complaint itchy redness macule and pimples on the right arm since 2 weeks. Initially just felt a little then expands. Patients with post operative brachial injury and uses a cast during one month. On examination there are erythematous macule unsharply marginated with papules. Potassium hydroxide examination, shows conidiophores, dichotomously branching and septate hyphae appropriate description with Aspergillosis Sp. Cultures found grow granular colonies, flat often with radial grooves, yellow at first but quickly becoming bright to dark yellow-green with age, For the identification microscope from the culture specimen there was conidia, phialde, conidiophore and vesicle that suitable with Aspergillus flavus. Patients received itraconazole 2 x 200 mg for 6 weeks and obtained satisfactory results. Discussion: Healthy hosts can develop cutaneous aspergillosis in surgical wounds, by traumatic inoculation, at sites associated with occlusive dressings. In some instances, a presumptive diagnosis of primary cutaneous aspergillosis can be made immediately by examining a potassium hydroxide preparation and culture. Conclusion: Diagnose of cutaneous aspergillosis can establish by potassium hydroxide and culture examination, therapy with itraconazole 2x 200mg give satisfactory results.

Article

Fusarium Nail and Skin Infection: A Report of Eight Cases from Natal, Brazil

February 2006 · Mycopathologia 161(1):27-31
DOI:10.1007/s11046-005-0136-9
Source · PubMed

Authors:

Nicácia Barbosa Calado

Francisco Sousa

Nadja Maryelly de Oliveira Gomes
University of São Paulo

Fernando Ramos Cardoso

Abstract

Fusarium spp. are non-dermatophytic hyaline moulds distributed worldwide and recovered from the nature as soil saprophytes and plant pathogens. Human infections are usually precipitated by local or systemic predisposing factors and disseminated infection is associated with impaired immune responses. We report eight cases of cutaneous lesions caused by Fusarium spp. All patients were immunocompetent. Seven cases with presented onychomycosis and one patient with interdigital intertrigo. It is important to alert the medical community about the relevance of the opportunistic fungi, such as Fusarium spp., which have emerged as human infectious agents, emphasizing the importance of correct etiological identification, allowing for appropriate treatment.

Guidelines and Recommendations for Onychomycosis and Onychomycosis NDM

- **S1 Guideline Onychomycosis** JDDG: Journal der Deutschen Dermatologischen Gesellschaft.2023;21:678–692.

(history, clinical examination, specimen extraction, culture, PCR and other, treatment)

- **NDM:** Need **recurrent** laboratory examination
- **Gupta AK**, Drummond-Main C, Cooper EA, et al. **Systematic review of nondermatophyte mold onychomycosis:** diagnosis, clinical types, epidemiology, and treatment. J Am Acad Dermatol. 2012;66(3):494-502.
- **English MP**. Nails and fungi. Br J Dermatol.1976;94(6):697-701.

Conclusion

- The possibility of the **faster detection of a pathogen and opportunistic pathogen** directly in patient samples/material - **significantly speeds up** diagnostics, alongside the **introduction of effective therapy**, with a positive impact on the outcome of the infection is important.
- Prevent overtreatment and adverse outcomes we need an **established criteria for onychomycosis candida and non-dermatophyte mold dermatomycosis**

Thank you

sanwidaty@ui.ac.id

sandra.widaty@gmail.com