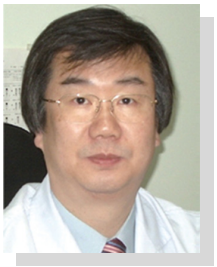
대한의진균학회
제22차 학술대회 초록

◐일 시 : 2015년 7월 18일(토)

◐장 소 : 서울대병원 소아병원 임상제1강의실

주최 : 대한의진균학회
대한피부과학회 피부진균연구회



존경하는 대한의진균학회 회원 여러분 안녕하십니까?
저희 대한의진균학회가 제22차 학술대회를 개최하게 되었습니다.

이번 학술대회에는 일본 Nagasaki University Shigeru Kohno 교수의 Clinical practice guidelines for the management of deep-seated mycoses에 대한 초청강의와 중국 Guangxi University Cunwei Cao 교수의 Recent advances in diagnosis and treatment of Panicilliosis marneffei에 대한 해외 초청강의가 예정되어 있습니다. 또한 이화의대 감염내과 김충종교수님의 Rare endemic mycoses in travelers에 대한 국내연자 특강과 울산의대 진단검사의학과 김미나교수님의 Antifungal resistance and susceptibility test에 대한 국내연자 특강도 마련되어 있습니다. 그리고 대구가톨릭대 박준수교수님의 Histopathology and immunohistochemistry in cutaneous fungal infections, 부산의대 고현창교수님의 Differential diagnoses and medical treatment of onychomycosis와 중앙의대 박귀영교수님의 Laser treatment of onychomycosis에 대한 교육강연도 준비되어 있습니다.

저희 대한의진균학회는 SCOPUS 등재학술지로서 한국학술연구재단의 등재학술지이기도 합니다. 최근에는 DOI를 부여받기도 하였습니다. 앞으로 Medline 등재를 위한 노력도 기울이고 있습니다. 또한 금년에도 예년과 같이 Nail forum과 Symposium을 준비하고 있습니다. 많은 참여를 부탁드립니다.

대한의진균학회가 앞으로도 전통을 이어가며 내실 있는 학회가 될 수 있도록 많은 협조를 부탁드립니다. 감사합니다.

대한의진균학회

회장 안 규 중

◈ 대한의진균학회 제22차 학술대회 진행계획표 ◈

시 간	내 용
09:00 ~ 09:30	등 록
09:30 ~ 09:40	개회식 **회장: 안규중 교수 (건국의대)**
	좌장: 우준희 교수 (울산의대)
09:40 ~ 10:10	국내연자 특강 1 Rare endemic mycoses in travelers 김충종 교수 / 이화의대 감염내과
	좌장: 신종희 교수 (전남의대)
10:10 ~ 10:40	국내연자 특강 2 Antifungal resistance and susceptibility test 김미나 교수 / 울산의대 진단검사의학과
10:40 ~ 11:00	*Coffee break*
	좌장: 노병인 교수 (서남의대)
11:00 ~ 11:50	해외 초청연자 특강 1 Recent advances in diagnosis and treatment of Penicilliosis marneffei Cunwei Cao, MD, PhD / Department of Dermatology, Guangxi Medical University First Hospital, China
11:50 ~ 13:30	기념촬영, 평의원회 및 중식
	좌장: 유희준 교수 (한양의대)
13:30 ~ 14:00	국내연자 교육강연 1 Histopathology and immunohistochemistry in cutaneous fungal infections 박준수 교수 / 대구가톨릭대 피부과
	좌장: 안규중 교수 (건국의대)
14:00 ~ 14:50	해외 초청연자 특강 2 Clinical practice guidelines for the management of deep-seated mycoses -Update by the Japanese Mycoses Forum- Shigeru Kohno, MD, PhD / Department of Molecular Microbiology and Immunology, Nagasaki University, Japan

시 간	내 용
14:50 ~ 15:10	*Coffee break*
	좌장:서무규 교수 (동국의대)
15:10 ~ 15:40	국내연자 교육강연 2 Differential diagnoses and medical treatment of onychomycosis 고현창 교수 / 부산의대 양산부산대병원 피부과
	좌장:최종수 교수 (영남의대)
15:40 ~ 16:10	국내연자 교육강연 3 Laser treatment of onychomycosis 박귀영 교수 / 중앙의대 피부과
	좌장:김광호 교수 (한림의대)
16:10 ~ 17:10	일반연제
17:10 ~ 17:30	폐회식 및 총회

▶학술대회 진행 시 유의 사항

1. 연제 발표자는 미리 10분 전에 앞줄에 대기하여 주시기 바랍니다.
2. 일반 연제는 원저인 경우 발표 7분, 임상증례는 발표 5분입니다.
3. 연제를 발표 1시간 전에 접수하여 주십시오.

◈ 22nd Annual Meeting of Korean Society for Medical Mycology ◈

Time	Content
09 : 00 ~ 09 : 30	Registration
09 : 30 ~ 09 : 40	Opening address **President : Kyu Joong Ahn** **(Dept. of Dermatology, Konkuk U)**
	Chair : Jun Hee Woo (Dept. of Infectious Diseases, U of Ulsan)
09 : 40 ~ 10 : 10	Special lecture 1 Rare endemic mycoses in travelers Chung Jong Kim (Dept. of Infectious Diseases, Ewha Womans U)
	Chair : Jong Hee Shin (Dept. of Lab. Med, Chonnam National U)
10 : 10 ~ 10 : 40	Special lecture 2 Antifungal resistance and susceptibility test Mi-Na Kim (Dept. of Laboratory Medicine, U of Ulsan)
10 : 40 ~ 11 : 00	*Coffee break*
	Chair : Byung In Ro (Dept. of Dermatology, Seonam U)
11 : 00 ~ 11 : 50	Invited lecture 1 Recent advances in diagnosis and treatment of Penicilliosis marneffei Cunwei Cao (Department of Dermatology, Guangxi Medical University First Hospital, China)
11 : 50 ~ 13 : 30	Photo, Board meeting & Lunch
	Chair : Hee Joon Yu (Dept. of Dermatology, Hanyang U)
13 : 30 ~ 14 : 00	Educational lecture 1 Histopathology and immunohistochemistry in cutaneous fungal infections Joonsoo Park (Dept. of Dermatology, Catholic U of Daegu)
	Chair : Kyu Joong Ahn (Dept. of Dermatology, Konkuk U)
14 : 00 ~ 14 : 50	Invited lecture 2 Clinical practice guidelines for the management of deep-seated mycoses -Update by the Japanese Mycoses Forum- Shigeru Kohno (Department of Molecular Microbiology and Immunology, Nagasaki University, Japan)

Time	Content
14 : 50 ~ 15 : 10	*Coffee break*
	Chair : Moo Kyu Suh (Dept. of Dermatology, Dongguk U)
15 : 10 ~ 15 : 40	Educational lecture 2 Differential diagnoses and medical treatment of onychomycosis Hyun Chang Ko (Dept. of Dermatology, Pusan National U)
	Chair : Jong Soo Choi (Dept. of Dermatology, Yeungnam U)
15 : 40 ~ 16 : 10	Educational lecture 3 Laser treatment of onychomycosis Kui Young Park (Dept. of Dermatology, Chung Ang U)
	Chair : Kwang Ho Kim (Dept. of Dermatology, Hallym U)
16 : 10 ~ 17 : 10	Free communications
17 : 10 ~ 17 : 30	Closing address and business meeting

◈ 대한의진균학회 제22차 학술대회 연제 순서 ◈

▣ 국내연자 특강 1　　09 : 40 - 10 : 10

제 목 : Rare Endemic Mycoses in Travelers

연 자 : 김충종 교수 (이화의대 감염내과)

좌 장 : 우준희 교수 (울산의대)

▣ 국내연자 특강 2　　10 : 10 - 10 : 40

제 목 : What is New in Antifungal Therapy for Dermatophye?

연 자 : 김미나 교수 (울산의대 서울아산병원 진단검사의학과)

좌 장 : 신종희 교수 (전남의대)

10 : 40 ~ 11 : 00　Coffee break

▣ 해외 초청연자 특강 1　　11 : 00 - 11 : 50

제 목 : Recent Advances in Diagnosis and Treatment of Penicilliosis marneffei

연 자 : Cunwei Cao

(Department of Dermatology, the First Affiliated Hospital of Guangxi Medical University, China)

좌 장 : 노병인 교수 (서남의대)

11 : 50 ~ 13 : 30　기념촬영, 평의원회 및 중식

▣ 국내연자 교육강연 1　　13 : 30 - 14 : 00

제 목 : 표재성진균증에서 조직검사와 면역화학염색

(Histopathology and Immunohistochemistry in Cutaneous Fungal Infections)

연 자 : 박준수 교수 (대구가톨릭대 의과대학 피부과)

좌 장 : 유희준 교수 (한양의대)

▣ 해외 초청연자 특강 2　　14 : 00 - 14 : 50

제 목 : Clinical Practice Guidelines for the Management of Deep-seated Mycoses

-Update by the Japanese Mycoses Forum-

연 자 : Shigeru Kohno

(Department of Molecular Microbiology and Immunology, Nagasaki University, Japan)

좌 장 : 안규중 교수 (건국의대)

14 : 50 ~ 15 : 10 Coffee break

▣ 국내연자 교육강연 2 15 : 10 - 15 : 40

제 목 : Differential Diagnoses and Medical Treatment of Onychomycosis

연 자 : 고현창 교수 (부산대학교 의과대학 양산부산대병원 피부과)

좌 장 : 서무규 교수 (동국의대)

▣ 국내연자 교육강연 3 15 : 40 - 16 : 10

제 목 : Laser Treatment for Onychomycosis

연 자 : 박귀영 교수 (중앙의대 피부과)

좌 장 : 최종수 교수 (영남의대)

▣ 일반 연제 FC-1 ~ FC-7 16 : 10 - 17 : 10

좌 장 : 김광호 교수 (한림의대)

FC-1. Skin Infection due to *Trichophyton tonsurans* Still Occurs in People in Korea but not as Outbreaks

..... Weon Ju Lee[1], Hyun Bo Sim[1], Yong Hyun Jang[1], Do Won Kim[1], Seok-Jong Lee[1], Jae Bok Jun[2], Yong Jun Bang[2] / Department of Dermatology, Kyungpook National University School of Medicine, Daegu, Korea[1], Institute of Medical Mycology, Catholic Skin Clinic, Daegu, Korea[2]

FC-2. A Case of Infantile Tinea Capitis Treated with Oral Fluconazole

..... Soo Hyeon Noh, Jin Kyung Chae, Sang Hyun Park, Kun Park, Eun Jung Kim / Department of Dermatology, Wonkwang University School of Medicine

FC-3. A Case of *Microsporum gypseum* Infection after Scratch Injury by Dog

..... Do Hyeong Kim, Wonkyung Lee, Jeong Nan Kang, Jung Eun Seol, Hyojin Kim / Department of Dermatology, Busan Paik Hospital, College of Medicine, Inje University

FC-4. Various Clinical Presentations of *Trichosporon asahii* Infecton

..... Tae Hoon Kim, Jeong Wan Seo, Seung Hwan Choi, Seung Min Ha, Ki Hoon Song, Ki Ho Kim / Department of Dermatology, Dong-A University College of Medicine, Busan, Korea

FC-5. Cutaneous Aspergillosis in a Immunocompetent Patient

..... Ji Yun Jung, Kwang Ho Kim / Department of Dermatology,
Hallym University Sacred Heart Hospital, Anyang, Korea

FC-6. Cutaneous Sporotrichosis of the Upper Eyelid in an Adult

..... Jun Gyu Song[1], Sang Youl Yun[1], Moo Kyu Suh[1], Gyoung Yim Ha[2], Jung Ran Kim[3] /
Departments of Dermatology[1], Laboratory Medicine[2] & Pathology[3],
College of Medicine, Dongguk University, Gyeongju, Korea

FC-7. Hyperkeratosis of the Nipple in Young Female maybe Associated with *Malassezia*

..... Jong Baik Kim, Hyun Ok Son, Sin Wook Chun, Suk Young Lee, Han Gyu Choi,
Han Kyoung Cho, Byung In Ro / Department of Dermatology, Myongji Hospital,
Seonam University College of Medicine, Goyang-si, Korea

17 : 10 ~ 17 : 30 폐회식 및 총회

해외 초청연자 특강
(Special Lecture)

Recent Advances in Diagnosis and Treatment of Penicilliosis marneffei

Cunwei Cao

Department of Dermatology, the First Affiliated Hospital of Guangxi Medical University, China

Abstract

Human penicilliosis marneffei (PSM) is an emerging infectious disease caused by the dimorphic fungus *Penicillium marneffei*, which was renamed as *Talaromyces marneffei* recently. The disease is endemic across a narrow band of tropical Southeast Asia, including southern part of China, Thailand, et al. Within these regions, this pathogen can cause fatal systemic infection for patients with compromised immune systems, such as human immunodeficiency virus (HIV)-infected patients, in Guangxi Province alone, nearly 17% patients with AIDS are infected with the pathogen. Skin lesions are common manifestation of disseminated *P. marneffei* infection which was seen in 67~86% patients. We will present different kinds of skin lesions related to PSM in order to enrich people's understanding of the mycosis.

The culture of *P. marneffei* from a specimen is the standard diagnostic method, which requires 10 to 14 days to perform and is difficult to meet clinical needs. Thus, we developed real-time quantitative PCR (qPCR) assay targeting the ITS1-5.8S rDNA region of *P. marneffei* for early specific diagnosis. The results showed, the hydrolysis probe-based assay, has an efficiency of 99%, a dynamic range of seven orders of magnitude and detection at least 5 to 10 copies of *P. marneffei* DNA. It does not amplify *Candida*, *Aspergillus spp*, *Fusarium* or *Rhizopus*. Its clinical sensitivity is demonstrated in serum samples from 56 proven PSM patients. Moreover, using the qPCR assay, we detected the fungal load changes at different times after antifungal therapy in 5 patients. The changes of the fungal load were consisted with the response of the patients to therapy. The study indicated serum-based Taqman real-time PCR assay was specific and sensitive in diagnosis *P. marneffei* infection. Most importantly, the method was useful in evaluated the outcome of treatment. The robustness, specificity and sensitivity of this assay make it an ideal molecular diagnostic tool for clinical use.

Voriconazole is a broad-spectrum triazole antifungal agent with potent *in vitro* activity against *P. marneffei*. In this study we evaluated voriconazole, as therapy for systemic *Penicillium marneffei* infections in 11 patients (including 7audlts and 4 children, 5 patients infected with HIV infection and 6 without). Patients were treated in the hospital setting with intravenous voriconazole, 6 mg/kg every 12 hours on Day 1 and then 4 mg/kg every 12 hours for 2 weeks, then switched to oral therapy at 200 mg twice a day as outpatients for a maximum

of 20 months. At the end of therapy, 10 of the 11 evaluable patients had favorable response to therapy, based on qPCR assay, mycological and clinical findings. There were no relapses of *P. marneffei* infection in the 10 patients who were observed at following up 2 years of the end of therapy. Our study indicated treatment systemic *Penicillium marneffei* infections with voriconazole was well tolerated, with no discontinuations caused by drug-related adverse events.

◐ CURRICULUM VITAE ◑

Cao Cunwei, Female, PhD and MD, Professor, Supervisor for Ph.D and M.S student

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Phone : 86 771 5356514
iPhone: 86 13978608798
E-mail : caocunwei@yeah.net

◖ EDUCATION ◗

1987 ~ 1992	Guangxi Medical University, B.Sc. degree
1996 ~ 1999	Guangxi Medical University, M.S. degree
2004 ~ 2007	Peking University, PhD. MD
2011 ~ 2012	Genetics department of the University of Melbourne, Australia, Visiting Academic researcher

◖ PROFESSIONAL EXPERIENCE ◗

1992 ~ 1997	tutor, Department of Dermatology and venereology, the First Affiliated Hospital of Guangxi Medical University
1997 ~ 2004	lecturer, Department of Dermatology and venereology, the First Affiliated Hospital of Guangxi Medical University
2004 ~ 2009	Associate Professor, Department of Dermatology and venereology, the First Affiliated Hospital of Guangxi Medical University
2009 ~ present	Professor, Department of Dermatology and venereology, the First Affiliated Hospital of Guangxi Medical University

◖ MAJOR INTEREST ◗

Therapy and diagnosis of Penicilliosis marneffei, the biology and molecular epidemiology, antifungal drug sensitivity, and gene function of *P. marneffei*.

◖ RECENT PUBLICATIONS ◗

Dongdong Mo, Xin Li, Chenghang Sun, Hao Liang, **Cunwei Cao***. *In vitro* interactions of calcineurin inhibitors with conventional antifungal agents against the yeast form of *Penicillium marneffei*. Mycopathologia. 2014;178:217-220 DOI 10.1007/s11046-014-9787-8.

LI Xin, WU Yi, MO Dongdong, YUAN Xihua, LUO Hong, DENG Zhuolin, **CAO Cunwei.** The Th1 immune response in the cutaneous lesions of Penicilliosis marneffei patients. Chin J Dearmatol. 2013;46(3): 28-32

Cunwei Cao, Ling Liang, Matthew C. Fisher, et al. Common reservoirs for *Penicillium marneffei* infection in humans and rodents, China. Emerging Infectious Diseases. 2011;17(2):209-214

Cunwei Cao, Glenn Bulmer, Jushang Li, et al. Indigenous Case of Disseminated Histoplasmosis from the *Penicillium marneffei* Endemic Area of China. Mycopathologia. 2010;170:47-50

Cunwei Cao, Wei Liu, Ruoyu Li, et al. *In vitro* interactions of Micafungin with other antifungal drugs against pathogenic yeast phase of *Penicillium marneffei*. J Antimicrob Chemother. 2009;63(2):340-342

Cunwei Cao, Wei Liu, Ruoyu Li. *Penicillium marneffei* SKN7, a novel gene, could complement the hypersensitivity of S. cerevisiae skn7 disruptant strain to oxidative stress. Mycopathogia. 2009;168:23-30

Cunwei Cao, Ruoyu Li, Zhe Wan, Wei Liu, Xiaohong Wang, Jianjun Qiao, Duanli Wang, Glenn Bulmer, Richard Calderone. The effects of temperature, pH, and salinity on the growth and dimorphism of *Penicillium marneffei*. Medical Mycology. 2007;45:401-407

Liu D, Liang L, Luo Q, **Cunwei Cao**. Morphology of *Penicillium marneffei* under oxidative stress *in vitro*. Mycoses. 2011;54(2):113-118

◖ FOUNDATION ◗

National Natrual Science Foundation of China (No: 81060128): The mechanism of echinocandins ineffective against the yeast phase of *Penicillium marneffei*. 2011.1-2013.12.

National Natrual Science Foundation of China (No: 81271804): Hog1-MAPK pathway in *Penicillium marneffei* latent infection. 2013.1-2016.12.

◖ PROFESSIONAL MEMBERSHIPS ◗

member in Mycological science of China.

Clinical Practice Guidelines for the Management of Deep-seated Mycoses -Update by the Japanese Mycoses Forum-

Shigeru Kohno

Department of Molecular Microbiology and Immunology, Nagasaki University, Japan

The number of patients with fungal infections is apparently increasing due to the increase of the patients with immune-compromising factors such as organ transplantation, hematopoietic stem cell transplantation, and receiving immunosuppressive agents. Common respiratory infections with pathogenic fungi are aspergillosis followed by cryptococcosis, pneumocystosis and others. The number of estimated life-threatening infections per year in the world is over 200,000 (aspergillosis), 1,000,000 (cryptococcosis) and 400,000 (pneumocystosis), respectively. The most significant finding for these infections is high mortality rates such as 30~95% (aspergillosis), 20~70% (cryptococcosis) and 20~80% (pneumocystosis), respectively. On the other hand, the financial budget for scientific research for medical mycology field is very limited and extensive research has been really required.

The new antifungals are rarely developed recently and only few posters were presented in recent conference such as ICAAC. Additionally, issue regarding drug resistance in fungal infections becomes a major topic similarly to the situations in bacterial infection field. Particularly, increasing concern about azole-resistant *Aspergillus fumigatus* and echinocandin-resistant *Candida* glabrata have been reported. The situation regarding management of deep-seated mycoses is becoming in miserable status due to 1) increasing patients, 2) limited new antifungals, and 3) drug-resistance. What we need to overwhelm these infections is to develop rapid diagnostic tools, new antifungals and novel treatment strategies.

Clinical guidelines for the Diagnosis and Management of Deep-Seated Mycoses have been issued from the Japanese Mycoses Forum in 2014 (only Japanese versions is currently available). In this session, I will introduce the outline of the Japanese guidelines and would like to share the latest information with the audience.

◐ CURRICULUM VITAE ◑

Shigeru Kohno

◖ Personal History ◗

First name: Shigeru
Last name: Kohno
Present address (Office): Nagasaki University Hospital,
1-7-1 Sakamoto, Nagasaki 852-8501, Japan
Date and Place of Birth: March 12, 1950, Nagasaki, Japan

◖ Academic History ◗

1968 ~ 1974	Nagasaki University School of Medicine
1976 ~ 1980	Postgraduate School Nagasaki University School of Medicine

◖ Employment Record ◗

1974 ~ 1976	Internship. 2nd Department of Internal Medicine, Nagasaki University School of Medicine
1980 ~ 1982	Research associate, Department of Pathology, University of New Mexico, U.S.A.
1983 ~ 1984	Sasebo General Hospital
1984 ~ 1985	Nagasaki Municipal Medical Center
1985 ~ 1990	Assistant Professor, 2nd Department of Internal Medicine, Nagasaki University School of Medicine
1990 ~ 1996	Lecturer (between assistant and associate professor), 2nd Department of Internal Medicine, Nagasaki University School of Medicine
1993 ~ 1994	Visiting scientist, National Institute of Allergy and Infectious Diseases, National Institutes of Health, U.S.A.
1996 ~ 2000. 03	Professor, 2nd Department of Internal Medicine, Nagasaki University School of Medicine
2000. 04 ~ present	Professor, Division of Molecular & Clinical Microbiology, Department of Molecular Microbiology & Immunology, Nagasaki University Graduate School of Medical Sciences
2005 ~ 2006	Vice director, Nagasaki University Hospital Medicine and Dentistry

2006 ~ 2009. 03	Dean, Nagasaki University School of Medicine
2009. 04 ~ 2014. 09	Trustee, Nagasaki University
	Director, Nagasaki University Hospital
2014. 10 ~ present	Trustee, Nagasaki University
	Vise president, Nagasaki University

◖ Academic Honors/Award ◗

1994	Futaki Award (Japanese Association of Infectious Diseases)
2002	Medical Mycology Award (Japanese Society for Medical Mycology)
2005	The Uehara Memorial Foundation Reserch Aid
	(The Uehara Memorial Foundation)
2010	Clinical Infectious Diseases Award for Outstanding Review
	(Infectious Diseases Society of America)
2014	Shiga/Hata Award (Japanese Society of Chemotherapy)

◖ Trustee ◗

Japanese Respiratory Society
Japanese Society for Tuberculosis
Japanese Society for Medical Microbiology (chief director)
Japan Society of Drug Delivery System
Japan Society of Clinical Physiology
Japan Society of Chemotherapy

◖ Councilor ◗

Japanese Society of Internal Medicine
Japanese Association of Infectious Diseases
Japanese Society of Environmental Infections
Japanese Society for Clinical Microbiology
Japan Society for Respiratory Endoscopy
Japan Lung Cancer Society
Japan Geriatrics Society
Japan Society of Sarcoidosis and other Granulomatous Disorders
Japanese Society of Molecular Medicine

◖ Academic Field ◗

Respiratory Infectious diseases, Mycology, Respiratory diseases, Chemotherapy

MEMO

국내연자 특강 1 김 충 종

2 김 미 나

국내연자 특강
(Special Lecture)

Rare Endemic Mycoses in Travelers

Chung-Jong Kim

Department of Infectious Diseases, Ewha Womans University

Histoplasmosis is an endemic disease in the Central and South America, caused by *Histoplasma capsulatum*[1]. It remains a frequent cause of opportunistic infection in patients whose immune system is impaired by drugs or human immunodeficiency virus (HIV)[2]. Clinical manifestations of histoplasmosis vary from asymptomatic infection to progressive disseminated infection[1]. Histoplasmosis also occurs in non-endemic areas, but at much lower frequency and the most common cause is prior exposure to endemic areas[3]. Because of its non-specific symptoms and signs, the physician in non-endemic area should recognize the conditions associated with the exposure to histoplasmosis for adequate diagnosis and treatment.

H. capsulatum is a soil-based fungus and inhalation of infectious particle with soils make a disease. Human-to-human transmission via the pulmonary route has not been reported. The organism has two forms, the mycelial phase and the yeast phase. The former is present at ambient temperature and on exposure to 37℃, it changes to yeast cells. This transmission from the mycelial phase to the yeast phase is the most critical determinant in the establishment of infection[4].

$CD4^+$ cells have an important role in controlling primary infection of *H. capsulatum*. In HIV-infected individuals, most cases of histoplasmosis develop when the $CD4^+$ cell count is lower than 200/μL[2]. Although the infection is limited by cell-mediated immunity, tissues are not sterilized. Infected individuals contain yeasts, some for which remain viable for many years. It is supported by the findings that individuals who have moved from endemic to non-endemic areas many years ago may have reactivated infection. The mechanism of reactivation remains unknown[5].

Infection with histoplasmosis is asymptomatic in most of cases. In immunocompetent patients it usually manifests as self-limited respiratory infection. Progressive disseminated histoplasmosis (PDH) is rare in adult hosts who are immunocompetent, but exposure to large inoculum or decreased immune function makes disseminated systematic disease, extrapulmonary organ involvements like hepatosplenomegaly, bone marrow suppression, adrenal gland enlargement[6]. In contrast to acute PDH, that progress aggressively within few days in non-immunosuppressed hosts, subacute PDH progress slowly, present milder symptom, and it also present in patients with lack of apparent immune deficiency. Without appropriate therapy, infections progress to death. In immunocompromised hosts, particularly those with AIDS, hematologic malignancies, and infants, disseminated histoplasmosis progresses aggressively within a few days and has a fatality rate of 100% if

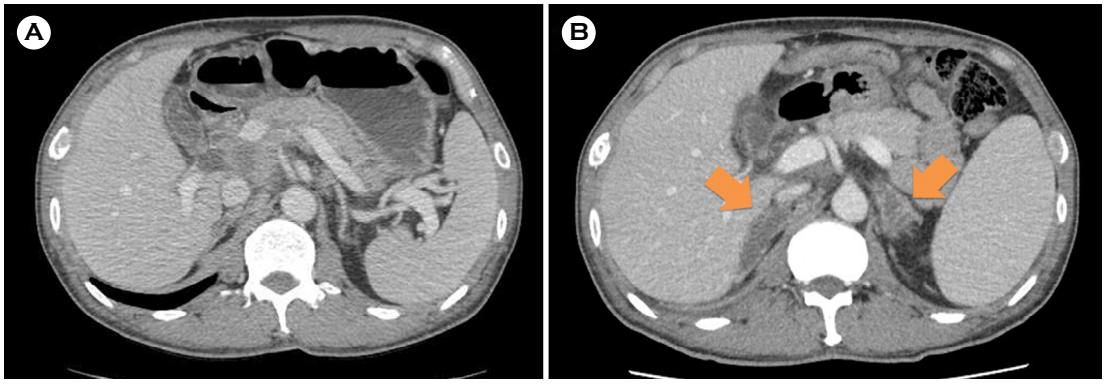

Fig. 1. (A) Abdomen and pelvis CT on September, 2013 showed no abnormality on both adrenal glands. (B) However, after 11 months when he revisited to the hospital for recurred symptoms, abdomen and pelvis CT showed newly appeared low-attenuated thickening of both adrenal glands. This finding suggested unusual infection of adrenal glands such as histoplasmosis or turberculosis. Also, adrenal lymphoma could be another differential diagnosis.

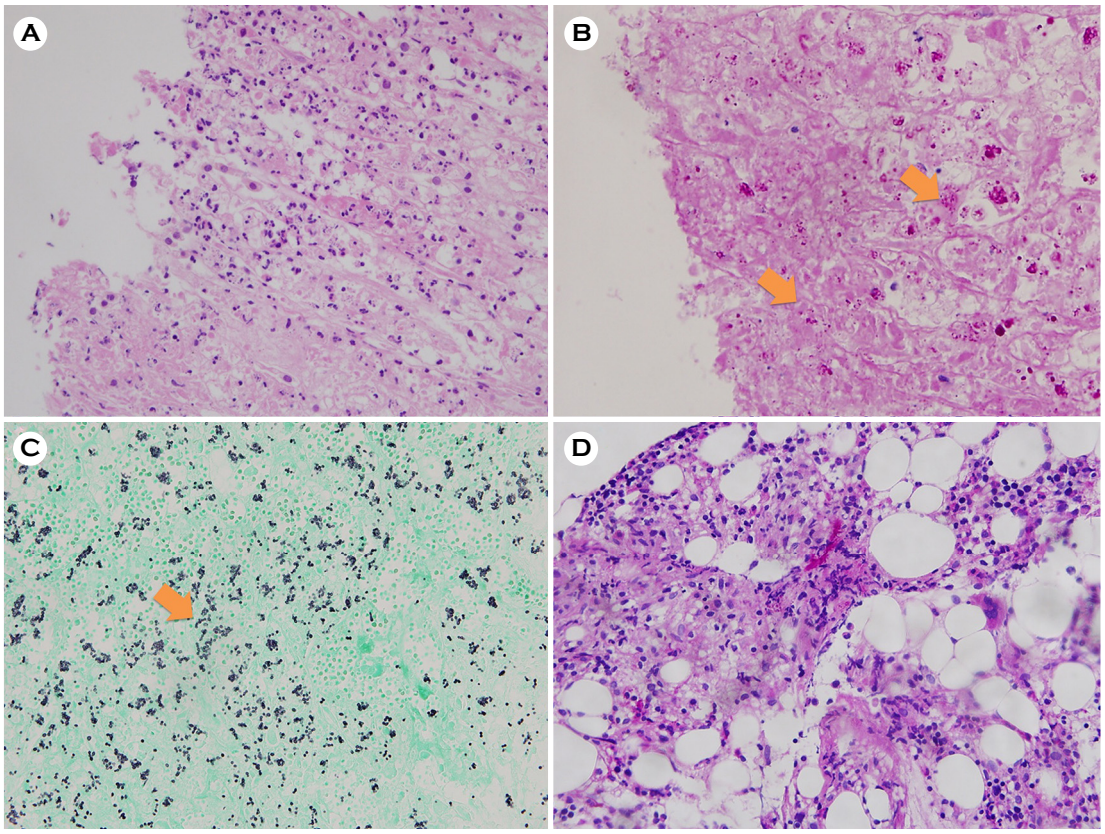

Fig. 2. Adrenal gland biopsies. **(A)** H&E stain ×400. **(B)** PAS stain ×400. **(C)** Giemsa stain ×400. **(D)** Bone marrow biopsy, PAS stain ×400. The small yeasts are well demonstrated by PAS stain.

not treated. In adults who are not overtly immunosuppressed, exposure to soil containing infectious particles can be an important risk factor for contracting disseminated histoplasmosis which progresses more slowly than in immunocompromised patients. However, if histoplasmosis is not treated, fatality rates of subacute or chronic PDH are similar to the acute form.

Cultures from blood, body fluids, or infected tissues are useful diagnostic tool in patients' high fungal burden. Antigen assay, which detect polysaccharide antigen, has high sensitivity and specificity and is used to monitor status of infection. Complement-fixing (CF) antibodies test also used to detect mycelial antibody and yeast antibody of *H. capsulatum*, a titer of 1:8 is considered positive, and a titer of 1:32 indicates definite diagnosis[7]. Stains for the presence of *H. capsulatum* in tissues or body fluids can rapidly identify the fungus. The periodic acid-Schiff (PAS) stain, Gomori methenamine silver (GMS) stain, Wright-Giemsa stain are widely used staining to detect fungus, and caseating or noncaseating granulomas are hallmark of the tissue infected with *H. capsulatum*[8].

Antifungal medications are commonly used to treat PDH. Amphotericin B is recommended for patients who are sufficiently ill to require ventilator support or IV fluids or nutrition. However, if the patient manifests with mild to moderate symptoms and does not require hospitalization, itraconazole for 6 to 18 months is the preferred treatment over amphotericin B, which is inconvenient and generally not well-tolerated.

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◐ CURRICULUM VITAE ◑

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◖ Education and Training ◗

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2012 ~ 2013	Infectious Diseases Fellow, Department of Internal Medicine, Seoul National University Hospital, Seoul, Republic of Korea
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International Young Investigator's Award by Infectious Diseases Society of America, 2011

Publication (as 1st author)

1. **Kim CJ**, Kang SJ, Yoon D, Lee MJ, Kim M, Song KH, Jang HC, Jung SI, Kim ES, Kim HB, Oh MD, Park KH, Kim NJ. Factors influencing culture positivity in pyogenic vertebral osteomyelitis patients with prior antibiotic exposure. Antimicrob Agents Chemother. 2015 Apr;59(4):2470-2473

2. **Kim CJ**, Kim HB, Oh MD, Kim Y, Kim A, Oh SH, Song KH, Kim E, Cho Y, Choi Y, Park J, Kim BN, Kim NJ, Kim KH, Lee E, Jun JB, Kim Y, Kiem S, Choi H, Choo E, Sohn KM, Lee S, Chang H, Bang J, Lee S, Lee J, Park S, Jeon M, Yun N. KIND Study group (Korea Infectious Diseases Study group). The burden of nosocomial staphylococcus aureus bloodstream infection in South Korea: a prospective hospital-based nationwide study. BMC Infect Dis. 2014 Nov 14;14:590

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Publication (as co-author)

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What is New in Antifungal Therapy for Dermatophye?

김 미 나

울산의대 서울아산병원 진단검사의학과

Contents

- New antifungal agents
- Antifungal susceptibility methods
- Antifungal susceptibility testing results
- Clinical significance of AFS

In-vitro Activity of Oral Antifungals in 320 Dermatophytes

Species	Geometric mean MIC (μg/mL)				
	Terbinafine	Griseofulvin	Itraconazole	Ketoconazole	Fluconazole
T. rubrum	0.172	1.61	0.06	0.67	11.05
T. mentagrophytes	0.142	2.66	0.045	0.94	18.82
E. floccosum	0.093	2.31	0.035	0.43	10.44
T. verrucosum	0.062	1.99	0.0186	0.77	16
T. tonsurans	0.088	24.24	0.147	0.79	13.92
M. canis	0.044	0.16	0.08	0.31	11.98
M. gypseum	0.044	2.82	0.051	3.36	45.25

* Adimi P et al. Iranian Journal of Pharmaceutical Research (2013). In-vitro Activity of 10 Antifungal Agents against 320 Dermatophyte Strains Using Microdilution Method in Tehran
* Conidia 1.25 x 10^4CFU/mL, RPMI with L-GLU, 7 day at 28°C

Clinical significance of *in vitro* Antifungal susceptibility

- Itraconazole and terbinafine
  - Most active for *T. rubrum, T. mentagrophytes* and *E. floccosum*
  - lowest GM MIC for *M. canis*
- Terbinafine
  - lowest GM MIC against *T. tonsurans, M. gypseum*,
- Griseofulvin.
  - highest GM (24.24) in *T. tonsurans* and lowest GM (0.16) in *M. canis*: best choice in Tinea capitis due to *M. canis*
  - susceptibility: *T. rubrum* >> *T. mentagrophytes and E. floccosum*
- Fluconazole: lowest susceptibility
  - susceptibility: *E. floccosum* >> *M. gypseum, T. mentagrophytes*
- Griseofulvin and fluconazole for dermatophyte infection should be used with a greater caution.

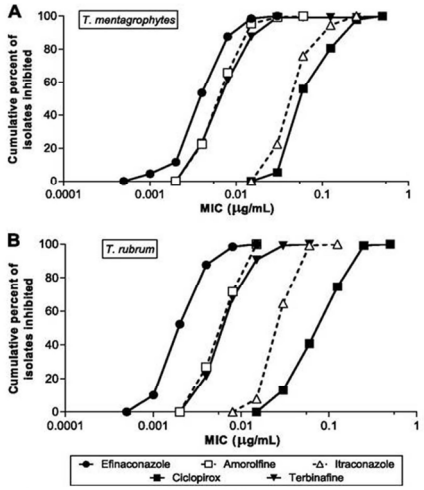
Increase in resistance to fluconazole and itraconazole in *T. rubrum* under drug pressure

- Among the strains grown with FLZ
  - ↑ MICs of FLZ in 17 (56.7%) and ITZ in 19 (63.3%)
- Among the strains grown with ITZ
  - ↑ MICs of ITZ in 24 (80%) and FLZ in 20 (66.7%)
- *T. rubrum* is capable to develop resistance toward the azoles after prolonged exposure to these drugs.
- Resistance of *T. rubrum* to azoles plays an important role in therapy failures and consequently contributes to persistence and chronicity of the infections

New antifungals for onychomycosis

- Oral drugs after trial II
  - Albaconazole, 400mg, 36wks, microbiological cure/complete cure 71%/33%
  - Posaconazole, 200mg, 24wks, MC/CC 70.3%/54.1%
  - vs. Terbinafine 250mg 12wks MC/CC 71.4%/37.1%
- Topical drugs approved by FDA after trial III
  - Efinaconazole, 10%, MC/CC 55.2%/17.8%
  - Tavaborole, vehicle, MC/CC 35.9%/17.9%

Cumulative MIC frequency distribution of efinaconazole and comparator drugs against T. mentagrophytes (n = 129) (A) and T. rubrum (n = 130) (B).



William J. Jo Siu et al. Antimicrob. Agents Chemother. 2013;57:1610-1616

Antimicrobial Agents and Chemotherapy

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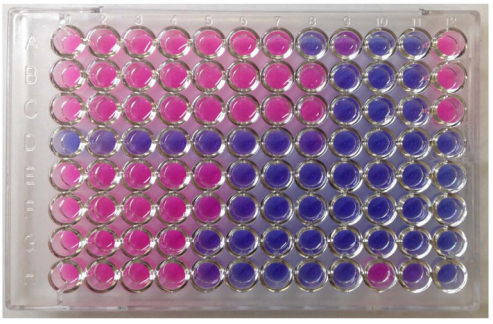
Antifungal activities of efinaconazole and four reference drugs against common onychomycosis-causing fungi

Organism (no. of isolates)	Test agent	MIC (μg/ml)			
		Range	MIC_{50}	MIC_{90}	Geometric mean
T. rubrum (130)	Efinaconazole	0.001–0.015	0.002	0.008	0.003
	Terbinafine	0.004–0.06	0.008	0.015	0.009
	Ciclopirox	0.03–0.5	0.125	0.25	0.101
	Itraconazole	0.015–0.125	0.03	0.06	0.037
	Amorolfine	0.004–0.015	0.008	0.015	0.008
T. mentagrophytes (129)	Efinaconazole	0.001–0.03	0.004	0.015	0.005
	Terbinafine	0.004–0.5	0.008	0.03	0.010
	Ciclopirox	0.03–0.5	0.06	0.25	0.094
	Itraconazole	0.03–0.25	0.06	0.125	0.063
	Amorolfine	0.004–0.06	0.008	0.015	0.009
C. albicans (105)[a]	Efinaconazole	≤0.0005–>0.25	0.001	0.06	0.0029
	Terbinafine	0.06–>16	1	4	1.409
	Ciclopirox	0.06–0.5	0.125	0.25	0.151
	Itraconazole	≤0.004–>2	0.008	0.125	0.014
	Amorolfine	≤0.03–0.5	0.03	0.125	0.041
C. albicans (105)[b]	Efinaconazole	≤0.0005–>0.25	0.004	>0.25	0.0079
	Terbinafine	0.125–>16	4	>16	6.873
	Ciclopirox	0.06–0.5	0.25	0.5	0.248
	Itraconazole	≤0.004–>2	0.015	>2	0.039
	Amorolfine	≤0.03–8	0.03	1	0.091

a. MIC endpoint determined at 24 h. b. MIC endpoint determined at 48 h.

Antifungal susceptibility testing methods for dermatophytes

- Broth microdilution
  - CLSI M38
  - EUCAST: high level EA and CA (N90%) between the 2 methods for testing fluconazole, voriconazole, and micafungin against 5 *Candida* species.
  - Commercial: Sensititre
    - The MICs obtained were lower by the Sensititre than the microdilution method
    - The best correlation between both methods was obtained for V *in T. mentagrophytes* (>80%), but was low for *T. rubrum*



E-test method

- Aktas AE et al, Eurasian J Med 2014
  - RPMI 1640 with L-Glutamine, 2% Glucose, 72-96 h
  - 5 antifungals: amphotericin B, fluconazole, itraconazole, ketoconazole, caspofungin

Disk diffusion test for dermatophytes

- Nweze et al. J Clin Microbiol 2010
- Modified from CLSI M44 compared to M38-A2
  - 1.0×10^6 conidia/ml. Mueller-Hinton (MH) agar
  - 4-7 days at 30ºC
  - Discs: ciclopirox (50 µg/disk), fluconazole (25 µg/disk), itraconazole (8 µg/disk), ketoconazole (15 µg/disk), miconazole (10 µg/disk), and voriconazole (1 µg/disk) were used (Rosco Neo-Sensitabs; Key Scientific, TX) // griseofulvin (10 µg/disk) and terbinafine (1 µg/disk)
- Terbinafine-susceptible vs resistant *T. rubrum* (ZD=0)

◐ CURRICULUM VITAE ◑

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2 고 현 창

3 박 귀 영

국내연자 교육강연
(Special Lecture)

표재성진균증에서 조직검사와 면역화학염색
(Histopathology and Immunohistochemistry in Cutaneous Fungal Infections)

박 준 수

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서 론

피부진균증은 일반적으로 피부영역 즉 표피, 진피 그리고 광의로 보았을 때 지방층까지의 진균감염을 뜻한다. 이는 깊이과 증상에 따라 다시 표재성과 심재성으로 나누게 된다. 대부분의 병적 감염 즉 질병이라고 부르는 영역의 대부분은 백선으로 대표되는 표재성 감염이다. 따라서 표재성 진균감염의 진단에는 KOH, 진균배양검사 등이 손쉽게 접근하고 쉬운 진단 툴이다. 상대적으로 피부병리조직검사는 진균의 진단에 상대적으로 주목 받지 못하는 것이 사실이다. 하지만 피부조직검사 나름대로 진단적인 가치가 있는 것임은 부인할 수 없는 사실이다. 이에 대해 알아보고 피부조직검사 시 주의점은 무엇인지 알아보자.

본 론

피부조직검사는 피부과영역에서 가장 기본적인 진단 툴 중의 하나이다. 그렇기 때문에 표재성 피부진균증의 대부분을 차지하는 일명 '무좀' 즉 백선이 전형적인 양상을 띄게 될 경우 실제 임상에서는 KOH 검사 또는 진균배양검사를 통해 대부분의 경우 진단과 치료가 이루어지게 된다. 하지만 임상 현장에서 전형적이지 않은 백선 이외의 경우 임상만으로 진단이 어려운 경우가 존재하게 된다. 그럴 경우 대부분 피부조직검사를 시행하게 된다. 하지만 이럴 경우 진균감염에 대한 생각 없이 조직에서 진균감염이 발견되는 경우가 있다. 이에 대한 확실한 인지와 지식이 없을 경우 진균감염을 간과하게 되는 경우가 생기기도 하는데, 그럴 경우 제대로 이루어지지 않거나 제대로 된 치료를 할 수 없게 된다.

일반적으로 표재성감염에서 피부조직검사가 유용하게 되는 경우는 스테로이드 등 잘못된 치료로 인해 전형적인 양성을 띄지 않은 잠행백선 (tinea incognito)의 진단에 가장 유용하게 쓰일 수 있다. 이러한 경우 조직검경을 할 때 반드시 주의해야 할 곳은 샌드위치 (Sandwich) 사인 등이 대표적인 각질층과 진균이 가장 잘 침범하는 부위 중 하나인 모낭이다.

심부감염의 경우 피부의 진피 이하 심재층 또는 이를 넘어 근육층 혹은 다른 장기에까지 영향

을 미치게 되는데 상당이 장기간의 염증소견을 거치기 때문에 주로 육아종성 변화를 보이게 되는 경우가 많다. 따라서 염증주위의 조직소견을 면밀히 관찰하는 것이 도움이 되며, 정상적인 사람피부의 구조가 아닌 물질들이 실마리가 되는 경우가 많다.

또한 특수염색이 도움이 되는 경우가 많은데 진균감염의 경우 인간의 세포와 달리 세포벽이 있고, 대사도 차이가 있기 때문에 이 차이를 보고 특수 염색하게 되며 진단에 많은 도움이 된다. 대표적으로는 PAS/D-PAS, Grocott, Methenamine silver 등이 있다.

결 론

피부진균증에 조직검사는 반드시 필요하지 않은 경우도 많다. 하지만 병변이 애매하거나 불분명한 경우 피부조직검경을 통해 얻을 수 있는 정보는 매우 많다. 이러한 정보도 진균감염에 대한 의심이 있을 때만 얻을 수 있으며, 이에 따른 진단율을 높일 수 있으므로, 특히 임상영역에서 피부조직검사를 시행하는 경우 피부진균에 대한 의심을 항상 하면서 접근하는 자세가 필요하다고 하겠다.

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◖ Education ◗

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2003 ~ 2005	Master of Medicine, Catholic University of Daegu School of Medicine, Daegu
2010 ~ 2012	Doctor of Medicine, Yeungnam University College of Medicine, Daegu (Dermatopathology)

◖ Career/Academic Appointments ◗

2002 ~ 2003	Internship in Daegu Catholic Uni. Medical Center
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2007 ~ 2008	Clinical instructor in Department of Dermatology, Daegu Catholic Uni. Medical Center
2008 ~ 2011	(a full-time) Instructor in Department of Dermatology, Daegu Catholic Uni. Medical Center
2011 ~	Assistant Clinical Professor in Department of Dermatology, Daegu Catholic Uni. Medical Center
2012 ~	Chief in Department of Dermatology, Daegu Catholic Uni. Medical Center
2012 ~	Honorary observership in St John's Institute of Dermatopatholgy, King's College London (E.Calonje)
2013 ~	Visiting scholarship in Department of Dermatopathology, Thomas Jefferson University
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2010 ~	Member, International Society of Dermatopathology
2012 ~	Member, American Academy of Dermatology
2013 ~	Member, European Academy of Dermatology and Venereology
2014 ~	Asssistant Administrator of Publication, Korean Society for Medical Mycology

Differential Diagnoses and Medical Treatment of Onychomycosis

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Onychomycosis is the disease of fungal infection on the nail. It is mostly caused by infection with dermatophytes, a group of three types of fungi those are *Trichophyton*, *Microsporum*, and *Epidermophyton*. When nail is affected by dermatophytes, this is referred to as tinea unguium. Onychomycosis can be also caused by non-dermatophyte molds like yeast, commonly *Candida albicans*.

The clinical manifestations of onychomycosis are that nail becomes friable and yellow hyperkeratotic plate and shows spike pattern due to the way the fungus invades. However, many disorders of nail can be mimic onychomycosis. Those include nail psoriasis, lichen planus, nail dystrophy due to eczema, yellow nail syndrome, nail change of alopecia areata, onychoschizia, periungual squamous cell carcinoma, and malignant melanoma. It is important to make a definite diagnosis before starting treatment.

A diagnosis of onychomycosis needs to demonstrate the presence of fungal hyphae and identify which species are present in the nail plate. The most common diagnostic tests are direct microscopic examination, mycologic culture, histopathologic study, and polymerase chain reaction (PCR)-based tests.

A wide array of medical treatments is available for the treatment of onychomycosis. Several factors including infecting organism, clinical presentation, and comorbidities should be taken into consideration when choosing the therapeutic strategy for onychomycosis. An oral treatment would generally not be appropriate for a superficial onychomycosis, which can be easily treated with a topical treatment. A topical antifungal may be a good treatment option when few nails are infected, but systemic antifungal would be appropriate when many nails are involved.

The efficacy of monotherapy with topical antifungal is limited by the low penetration through nail plate, but ciclopirox and amorolfine nail lacquers have been shown to be effective against onychomycosis. Nail lacquers can decrease transonychial water loss and have the potential to induce the germination of dormant and drug-resistant conidia, which help to eradicate the fungus and reduce the recurrence of onychomycosis. Topical treatment is indicated for superficial white onychomycosis, and it could be a therapeutic option when there is distal subungual onychomycosis that affects less than half of the surface without nail matrix involvement.

Oral antifungal treatment is generally more effective than topical treatments, but it is also associated with higher risks of adverse events and drug to drug interactions. The patients with comorbidity commonly use

concomittent medications, which increases the risk of drug interactions with oral antifungals. Oral treatment is recommended for proximal subungual onychomycosis and for the patients whose conditions have not responded after 6 months of topical treatment. The main oral treatments are terbinafine, itraconazole, and fluconazole.

Recently, new and reformulated antifungal drugs are in development for the treatment of onychomycosis. The goal of new treatment is to improve on topical drug efficacy using new molecules or permeation enhancers, to diversify drug targets and to expand on previously successful base molecules to produce new drugs. Oral drugs in development include albaconazole, posaconazole and pramiconazole and topical drugs in development are azoles, allyamines, benzoxaboroles, nanoemulsions and photosensitizers. Above all, two new topical drugs such as efinaconazole and tavaborole have received FDA approval. A summary of all of the molecules in development can be seen in Fig. 1.

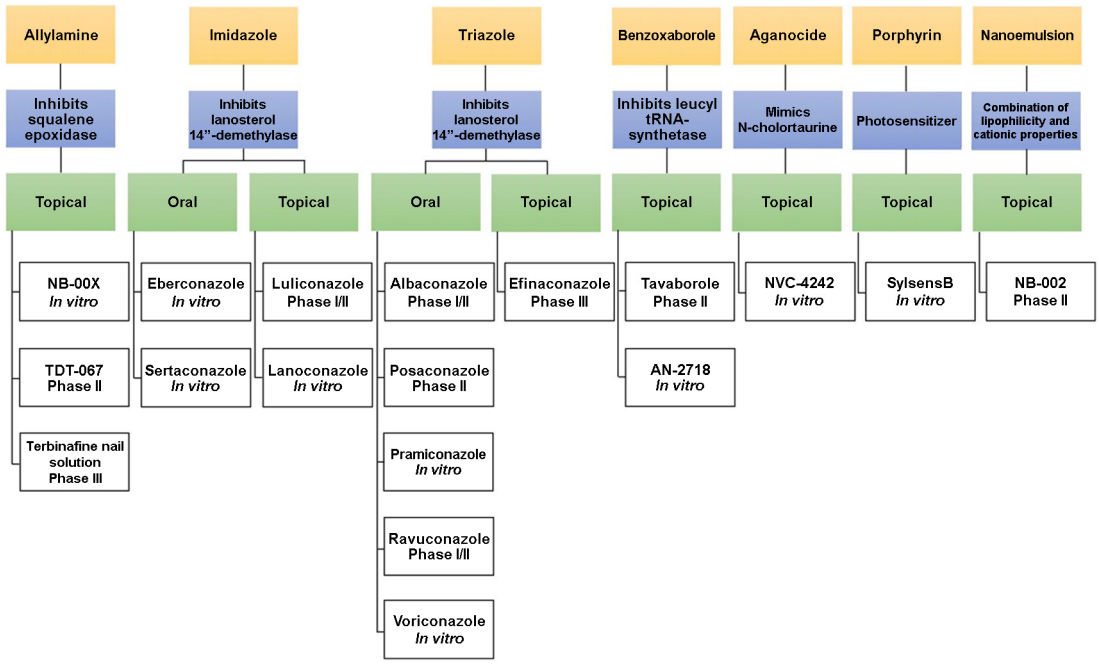

Fig. 1. Summary of drugs in development for the treatment of onychomycosis indicating the highest completed level of evidence.

◐ CURRICULUM VITAE ◑

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The Korean Society for Skin Barrier Research

MEMO

Laser Treatment for Onychomycosis

Kui Young Park

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Onychomycosis is a fungal infection of the nail. It is the most common disease of the nails and the most common symptom of a fungal nail infection is the nail becoming thickened and discoloured. Treatment of onychomycosis is challenging because the infection is embedded within the nail and is difficult to reach. It may take a year or more, since new nail growth must entirely replace old, infected growth. Following effective treatment recurrence is common (10~50%) and the treatment failure is shown in 20~30%. Topical treatments alone are generally unable to cure onychomycosis because of insufficient nail plate penetration, and oral therapy may show different cure rate in accordance with patient's compiance due to long therm use of drugs. Additionally, debate is always raised about the safety of oral drugs, despite many years' experience with these agents and safety reporting. Antifungal drugs, like many others, are contra-indicated in patients with active or chronic liver disease and are sometimes declined by patients seeking alternatives to oral medication - often to avoid potential for side-effects. Other surgical therapy, such as nail avulsion might be painful and inconvenient for patients.

Recently, laser technologies have been introduced as a treatment for onychomycosis avoiding the disadvantages of systemic and topical drug therapies, offering a rapid treatment for an often persistent nail condition. There have been some original or case reports about photodynamic therapy or laser for treating onychomycosis. Watanabe *et al*. reported two cases treated with PDT using 630 nm pulsed laser light, and Piraccini *et al*. demonstrated cured cases by PDT using 630 nm LED. In a pilot study, 7 of 8 patients (88%) with onychomycosis were cured with 1,064 nm Nd:YAG laser treatment in 2~3 sessions 3 weeks apart. Another pilot study showed 81% of moderate to complete clearance after 1,064 nm Nd:YAG laser treatment in 1~3 sessions with 4 or 8 weeks intervals.

The proposed mechanism of action of lasers in the treatment of onychomycosis remains unclear. However, laser systems in near infra-red spectrum (780~3,000 nm wavelength), which are commonly used in onychomycosis, exert their effect by direct heating of the target tissues. Moreover, by using a pulsed beam instead of continuous beam, these lasers can deliver a "selective photothermolysis" - delivering of a short burst of laser light energy into the target tissue causing a rapid elevation in temperature into the defined target area. Sufficient intervals between pulses can allow for tissue relaxation and cooling, causing very little collateral damage to surrounding structures. In the laboratory, eradication of the common dermatophyte *Trichophyton rubrum* has been demonstrated using pulsed laser technology. Studies on fungal nail clippings

have demonstrated this to have a direct thermal killing effect on fungal mycelia when treatment temperatures exceed 50℃. Carney *et al*., on the other hand, recently reported that 1,064-nm Nd:YAG did not have antifungal effect *in vitro* and *in vivo* study. Hollmig *et al*. also showed that there was no significant mycological culture or clinical nail plate clearance with 1,064-nm neodymium:yttrium-aluminum-garnet laser compared with control.

Based on these previous reports and my own experience, I'd like to discuss about the practically helpful laser treatment for patients with onychomycosis.

◐ CURRICULUM VITAE ◑

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◖ Academic Appointment ◗

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◖ Education & Board Certifications ◗

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Member, The Korean Dermatologic Association

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Assistant administrator, The Korean Society for Anti-Aging Dermatology

Assistant administrator, The Korean Medical Society for Cosmetics

MEMO

구연 연제 초록 (Free Communication)
[FC-1 ~ FC-7]

FC-1

Skin Infection due to *Trichophyton tonsurans* Still Occurs in People in Korea but not as Outbreaks

Weon Ju Lee[1], Hyun Bo Sim[1], Yong Hyun Jang[1], Do Won Kim[1], Seok-Jong Lee[1], Jae Bok Jun[2] and Yong Jun Bang[2]

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Since 1995, *Trichophyton tonsurans* has been reported as one of the causative agents of dermatophytosis in Korea. Herein we evaluate 77 patients infected with *T. tonsurans* who visited an outpatient clinic between 2004 and 2014. Infections due to *T. tonsurans* were diagnosed on mycological examination, including direct microscopic examination with 15% KOH and culture on potato dextrose agar complemented with 0.5% chloramphenicol. The annual prevalence of infection due to *T. tonsurans* was the highest in 2014 (15 cases) but remained constant in the general population between 2004 and 2014. The ratio of male to female patients was 1:0.3. The spring season presented the highest incidence compared with other seasons, with 27 cases. The incidence of infections due to *T. tonsurans* among combat sports players was higher in spring and fall compared with summer and winter whereas the incidence in the general population was the highest in the winter. The body site most commonly affected was the face. Tinea corporis was the most common subtype of dermatophytosis caused by *T. tonsurans*. Herein, we demonstrate that the prevalence of infection with *T. tonsurans* over the study period remained constant in Korea.

FC-2

A Case of Infantile Tinea Capitis Treated with Oral Fluconazole

Soo Hyeon Noh, Jin Kyung Chae, Sang Hyun Park, Kun Park and Eun Jung Kim

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Tinea capitis is a dermatophyte infection of hair and scalp typically caused by *Trichophyton* and *Microsporum* species. Peak incidence occurs in children between 3 and 14 years of age. The zoophilic dermatophyte *M. canis* is the most prevalent species found in the Korea.

A 10-month-old boy presented with a 1-month history of hair loss scaly patches located on the right parietal scalp. He received topical antifungal agent. However lesions did not improve and gradually spread. Microscopic examination of KOH prepared hair specimen of scale showed fungal hyphae with ectothrix pattern. In Wood's lights, there was yellow-green fluorescence upon exposure. The fungal culture on the Sabouraud's agar plate revealed yellow smooth colony developed a white velvety fuzz. The fungus had irregulary septate hyphae and chlamydospores on lactophenol cotton blue stain. He was finally diagnosed as tinea capitis by *M. ferrugineum* and treated with oral fluconazole and topical clotrimazole cream for 47 days. The lesion was cleared and negative on repeated KOH and Wood's lights.

We report a rare case of infantile tinea capitis treated successfully with oral fluconazole which was administered for 47 days.

FC-3

A Case of *Microsporum gypseum* Infection after Scratch Injury by Dog

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Microsporum gypseum is a geophilic dermatophyte that grows in the soil. It occasionally causes dermatophytosis that is characterized by rapid development and resolution. A 5-year-old female presented with asymptomatic annular, scaly, erythematous plaques on her right ankle. She lived in rural area, and a domesticated dog scratched her right ankle 3 weeks ago. Skin lesions occurred on healed area of scratch wound 2 days ago. Histopathologic findings showed fungal hyphae on stratum corneum, and *M. gypseum* was identified with tissue culture and polymerase chain reaction. Skin lesions improved after 4 weeks of sertaconazole cream application. Dermatophytes isolated from dogs includes *M. canis*, *M. gypseum*, *Trichophyton metagrophytes*, *M. persicolor*. In this case, it was assumed that dog's claws might have carried *M. gypseum* or *M. gypseum* were transferred to scratched area by being rubbed in contaminated soil. Dermatophytosis by *M. gypseum* is unusual, and to the best of our knowledge, there has been no case of *M. gypseum* infection after scratch injury by dog.

Herein, we report an unusual case of *M. gypseum* infection after scratch injury by dog.

FC-4

Various Clinical Presentations of *Trichosporon asahii* Infecton

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Trichosporon spp. are basidiomycetous yeast-like anamorphic organisms that are widely distributed in nature In humans, these fungal species are part of the gastrointestinal and oral cavity microbiota occasionally and can transiently colonize the respiratory tract and skin. *T. asahii* infection in human often causes benign superficial lesions of hair, called white piedra. And *T. asahii* is reportedly isolated from the patients with tinea pedis and onychomycosis. Moreover, *T. asahii* is noted for an opportunistic pathogen that can cause life-threatening invasive infections in immunocompromised hosts and it is frequently associated with indwelling medical devices. After biofilm is formed, *T. asahii* is resistant to the most common clinical antifungal agents and may become life-threatening conditions. Herein, we report 3 cases of *T. asahii* infection manifested as various clinical presentations.

CASE 1

A 37-year-old woman presented with multiple erythematous erosive patches with scales on feet and hands for 4 years. In fungus culture, white wrinkled colonies with irregular margins appeared. Lactophenol cotton blue stain showed spores and blastoconidias on slide culture. Matrix-assisted laser desorption-ionization -time-of-flight mass spectrometer (MALDI-TOF MS) and DNA sequencing proved to be *T. asahii*. After 3 months' treatment with oral itraconazole and fluconazole, skin lesions improved in partial remission.

CASE 2

A 57-year-old woman presented with multiple whitish nodules of hair shafts for 3 years. In fungus culture, white wrinkled colonies appeared. And lactophenol cotton blue stain revealed septated hyphae and arthroconidia on slide culture. DNA sequencing study result showed 98% analogy to *T. asahii*. 6 months' oral itraconazole treatment with ketoconazole shampooing subsided the skin lesions.

CASE 3

A 54-year-old woman was treated with 3 cycles of rituximab for pemphigus vulgaris for months and presented with solitary erythematous erosive patch with multiple sattelite lesions on intertrigenous area in the right axilla for recent 1 month. In fungus culture, white wrinkled colonies appeared, and *T. asahii* was identified from slide culture. The skin lesions were subsided by topical treatment of fluconazole cream for 1 month.

Key Words: *Trichosporon asahii*, Biofilm, White piedra, Tinea pedis, Intertrigo

FC-5

Cutaneous Aspergillosis in a Immunocompetent Patient

Ji Yun Jung and Kwang Ho Kim

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Fungi of *Aspergillus* genus are widely distributed in nature, particularly in the soil and in decomposing vegetation. They are frequent opportunistic pathogens in immunocompromised patients, second only to *Candida*. The most common agent is *A. fumigatus*, followed by *A. flavus*, mainly in invasive disease in immunocompromised patients, and in nasal or paranasal sinus lesions. Cutaneous aspergillosis is a rare condition. There are several factors that predispose to aspergillus infection: the most frequent are granulocytopenia, haematological disorders, diabetes, the neonatal period, local tissue injury, and any primary or acquired diseases that cause immunosuppression.

A 24-year-old male was referred to department of dermatology for his skin lesions on the both axillary areas. The skin lesions showed localized erythematous to brownish scaly patches on the both axillary areas. A KOH mount fungal smear showed fungal hyphae, and *A. flavus* was grown in culture. RNA sequencing result was also inconsistent with Aspergillosis species. He was treated with itraconazole 200 mg daily for 4 weeks, and showed a good response. This case is thought to be peculiar in that cutaneous aspergillosis is detected in an immunocompetent host.

FC-6

Cutaneous Sporotrichosis of the Upper Eyelid in an Adult

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Sporotrichosis is a chronic infectious disease caused by *Sporothrix(S.)* schenckii. Fixed form of sporotrichosis is rare than lymphocutaneous form. Initial cutaneous lesion is most frequently on an exposed area, commonly the face in children and the upper extremity in adults.

We report the fixed cutaneous sporotrichosis in a 57-year-old women. The lesions were manifested by erythematous plaques with swelling on the right upper eyelid. The fungal culture from biopsy specimen on Sabouraud's dextrose agar showed dark brown to black, moist and wrinkled colonies of *S. schenckii*. Histopathologically, pseudoepitheliomatous hyperplasia and chronic granulomatous inflammation were observed on H & E stain. Septate branched mycelia and clustered conidia were observed in slide culture. The nucleotide sequence of internal transcribed spacer for clinical isolate was identical to that of *S. schenckii* strain KMU 3360. The patients were treated with 200 mg of oral itraconazole daily for 6 months. The Skin lesions were completely cured and recurrence is not observed to date.

Key Words: Adult, Cutaneous sporotrichosis, Upper eyelid

FC-7

Hyperkeratosis of the Nipple in Young Female maybe Associated with *Malassezia*

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Hyperkeratosis of nipple/areola (HNA) is rare condition characterized by hyperpigmented, verrucous, keratotic thickening of the nipple, areola or both. It is classified into 3 distinct types: HNA that represent extension of epidermal nevus, HNA associated with other dermatoses and idiopathic HNA, also known as nevoid HNA. Yet, only 3 cases of hyperkeratosis of nipple associated with *Malassezia globosa* have been published.

A 17-year-old woman presented to our hospital with hyperkeratotic plaques on both nipples for 3 years. The lesions were asymptomatic, 0.5 cm in diameter and had round, verrucous surfaced plaques on each nipple. The patient did not have any other skin lesion. Biopsy was performed at the right nipple and the specimen showed hyperkeratosis and irregular acanthosis. Many yeast cells were detected in the stratum corneum on Grocott's Methenamine Silver (GMS) stain. Fungus culture was done on Leeming and Notman agar but showed no growth. Patient was treated with PO and topical antifungal agent and topical retinoid.

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