The Scientific Meeting of the Nordic Society for Medical Mycology and the Finnish Society for Medical Mycology

Biomedicum 1, Helsinki May 25, 2011

8th Scientific Meeting of the NSMM

A joint meeting with

The Finnish Society for Medical Mycology (FSMM)

Helsinki, Finland, May 24-25, 2011

Tuesday May 24

19.00 **Get Together Dinner** (Dinner fee 45€)

Wednesday May 25

09.00-10.00 **Coffee & Exhibition**

09.00-09.50 **NSMM Annual general meeting**

10.00-11.00 **Opening Ceremony and SESSION I *Keynote Lecture***

10:00-10.15 *Opening remarks and welcome*
NSMM and FSMM representatives.

10.15-11.00 *Fungus; from a rarity to a regular customer with specific demands (45 min)*
Ben de Pauw. The Netherlands

11.00-13.00 **SESSION II *"Mould Building Syndrome"***

Moulds as moisture indicators (30 min)
T. Putus, FI

Activation of inflammatory response by fungal cell wall components and toxins (30 min)
S. Matikainen, FI

Fungal infections and construction work (30 min)
A. Nihtinen, FI

Symptoms caused by environmental moulds; any treatment for patients? (30 min)
V. Valtonen, FI

13.00-14.00 **Lunch & Exhibition & Optional Lunch MiniSymposium at MobiDiag**
"Microarray brings new era to easier fungal diagnostics"
(max 40 attendees, separate registration needed)

14.00-14.50 **SESSION III *"Update your SKINAVAG)-mycology"***

SKINA*/Skin and nail infections (30 min)*
D. Saunte, DK

VAG*/Vaginal infections (20 min)*
P. Nieminen, FI

14.50-15.45 **Coffee & Exhibition**

15.45-17.05 **SESSION IV *"Imported mycological infections;***

Case reports" (20 min each)
An AIDS patient from Africa, V. Friman, SE
A man from Sri Lanka with a problematic foot, I. Nordøy, NO
A Thai woman with cough, fever and weight loss, M.C. Arendrup, DK
Pneumonia outbreak in a tourist group in Malaysia, Tamim Khawaja, FI

17.05-17.15 **Closing of the joint meeting**

17.15-18.00 **FSMM General Meeting**

The meeting will take place at:
Biomedicum Helsinki, Finland

Abstract. 8th NSMM meeting in Helsinki. May 24-25, 2011

Title: **MOULDS AS MOISTURE INDICATORS**

Author: **Putus Tuula M.**

Affiliations: University of Turku

Abstract text:

Backgound.

Moulds are ubiquitous in nature. More than 200 000 different fungi and yeast have been identified in various surroundings and climatic zones. In Nordic countries and in other parts of western world, much attention has been paid on moisture damaged buildings and related adverse health effects. How can we distinguish between 'normal' microbial flora and moisture damage may potentially cause ill health in occupants – or can we?

Materials and Methods,

In European countries, Canada and Unites States of America, a large number of environmental mycologists have investigated and described microbial flora in buildings and compared their findings in different countries and climatic zones, as well as in moisture damaged building and sc. 'normal' or reference buildings. In mid 90'ies, the concept of indicator microbes was introduced in an international meeting in Baarns, NL (Samson et al. 1994). In this book, also health implications of environmental fungi were discussed.

The concept of indicator fungi means indication of damage in the building, not necessarily indication of health risk for the occupants. Indicator microbes are cultivated on agar or liquid substrate and identified microscopically. Only viable spores are counted.

Results.

Based on systematic research and findings in several countries, a list of the sc. indicator microbes was agreed upon in the Baarn meeting.

Indicator microbes may be found in indoor air or they grow on surfaces and in building materials. They are divided into groups according to their ability to grow in different environmental conditions (low, medium or high water activity in the growth medium) or ecological succession after the moisture damage (primary, secondary and tertiary microbes.

After that point of time, only a few new names have been introduced to the list of indicator microbes. In Finland, national guideline values are given according to this indicator list and national legislation. By now, the Finnish Ministry of Social Affairs and Health has published four consecutive versions of national guide books of indoor air problems in residential buildings and the Institute of Health and Welfare one guidebook for school buildings.

Discussion.

Researchers and environmental health authorities agree upon that most fungi are part of normal environment and a limited number of fungi indicate moisture damage or 'sick building'. On the other hand, the health impact of both 'normal' and indicator microbes are known only vaguely and the mechanisms behind the adverse health effects remain partly obscure. However, risk assessment can and must be done in practical situations although our knowledge is fragmental. Fungi that cause allergies, asthma, infections and toxic reactions exist in both groups, indicator and 'normal flora'. The list of indicator microbes helps us to identify problem buildings and reduce the health risk for occupants.

Abstract. 8th NSMM meeting in Helsinki. May 24-25, 2011

Title: **FUNGAL INFECTIONS AND CONSTRUCTION WORK**

Author: Anne Nihtinen, MD,

Affiliation: North Carelia Central Hospital, Joensuu, Finland

The inhalation of airborne *Aspergillus* conidia can cause invasive pulmonary aspergillosis (IPA) in immunocompromised patients, such as haematopoietic stem cell or solid organ transplantation recipients, and patients receiving chemotherapy for acute leukaemia. The mortality of patients with IPA is 50 - 90%. Overall, air filtration with high-efficiency particulate air (HEPA) filtration or laminar air flow (LAF) reduces the fungal contamination of air. Placing high-risk immunocompromised patients in rooms with such air filtration techniques thus decreases the incidence of IPA. Construction work is known to liberate great amounts of *Aspergillus* spores. Construction work inside or adjacent to the hospital can cause nosocomial outbreaks of aspergillosis if the air filtration is not functioning properly or the ventilation channels become contaminated with *Aspergillus* conidia. To avoid outbreaks, protective measures should be implemented during construction or renovation activity. These measures include building protective barriers around the construction site, covering all air conditioning ducts, using negative-pressure ventilation on in-hospital renovation areas, isolating the traffic to and from the construction site, and intensive cleaning work of areas with visible dust and debris. The protective measures should be designed before the start of the construction work. The function of the air filtration system should be monitored during the work. The air quality can also be monitored with techniques such as particle measurements, air sampling, and surface sampling. Several studies have indicated that prospective monitoring of air quality during construction or renovation activity in areas with high-risk patients may show a potential failure of the protective measures and thus prevent an aspergillosis outbreak.

Abstract. 8th NSMM meeting in Helsinki. May 24-25, 2011

Title: **ACTIVATION OF INFLAMMATORY RESPONSE BY FUNGAL CELL WALL COMPONENTS AND TOXINS**

Author: Sampsa Matikainen.

Affiliations: Innate Immunity Research Group, Unit of Immunotoxicology, Finnish Institute of Occupational Health, Helsinki, Finland

β-glucans are naturally occurring polysaccharides that are the major cell wall components of fungi. Here we have characterized the global pattern of secreted proteins, or secretome, of human primary macrophages upon β-glucan stimulation using proteomic methods. We show that β-glucan stimulation of human macrophages activates robust secretion of different growth factors, chemokines, cytokines, and unconventionally secreted proteins. These included pro-inflammatory cytokines IL-1β and IL-18 demonstrating that β -glucans activate NLRP3 inflammasome in human macrophages. The inflammasome is a cytoplasmic multiprotein complex that controls secretion of IL-1β and IL-18 through activation of caspase-1. Furthermore, β-glucans and trichothecene mycotoxins synergistically induced very high secretion of IL-1 and IL-18 demonstrating that fungal metabolites can be potent activators of inflammatory response. The mechanism of β -glucan- and mycotoxin-induced inflammatory response is discussed.

Abstract. 8th NSMM meeting in Helsinki. May 24-25, 2011

Title: **SYMPTOMS CAUSED BY ENVIROMENTAL MOULDS; ANY TREATMENT FOR PATIENTS?**

Author: Ville Valtonen, M.D. professor

Affiliations: Division of Infectious Diseases, Department of Medicine, Helsinki University Central Hospital, Helsinki, Finland

There are many terms and definitions used in literature to describe moisture building syndrome and related disorders like mold allergy, organic dust toxic syndrome, volatile organic compound syndrome, indoor air pollution and sick building syndrome. In this lecture I use the following definition: mold building syndrome includes any clinical symptoms in patients exposed to persistent or repeated dampness and microbial growth on interior surfaces and in building structures, and which symptoms are typically aggravated in buildings with moisture damages, and which symptoms are probably caused by molds and other microbes by immunological, toxic or other mechanisms.

The clinical symptoms vary from patient to patient, but in general the irritative symptoms like itching and redness in eyes and sneezing and cough from respiratory tract predominate in the beginning. Later on increased amounts of respiratory tract infections like sinusitis and bronchitis occur, but also skin manifestations, neurologic symptoms and arthralgia are rather common. Some patients may develop asthma, but allergic alveolitis is very rare. Also various autoimmune diseases like rheumatoid arthritis and vasculitis have been described in mold building syndrome.

The diagnosis of mold building syndrome is always a clinical diagnosis. There are at the moment no good diagnostic laboratory tests for the syndrome. The diagnosis is based on 1) the clear association of the symptoms with the exposure of the patient to buildings with moisture damages 2) typical clinical picture with the aggravation of the symptoms with exposure to molds and other microbes 3) diminishing amounts of symptoms with the avoidance of molds and moisture buildings.

We are urgently needing better laboratory tests to confirm the clinical diagnosis and we do not know which people are in greatest risk to develop this syndrome. However, there are great differences between persons to develop this syndrome even with the same exposure time in the same building favoring the theory that there are genetic susceptibilities and also protective unknown factors in this syndrome.

The treatment of this syndrome is difficult especially in later phases of the disease but the avoidance of the molds and buildings with moisture damages is essential and the most important form of the therapy. Antihistamines, corticosteroids, antibacterial agents and antifungal therapy help some patients but they are not the key elements to resolve this problem. Experimental therapy with IV-immunoglobulins may help some patients with severe forms of the syndrome but no controlled trials have been done with IV-immunoglobulin in this syndrome. According to my experience the renovation of the building with moisture damages does not help much those patients which are very sensitive to molds but may help to prevent more people to get this mold building syndrome. Good quality in construction work is probably the key element to diminish this syndrome.

Abstract. 8th NSMM meeting in Helsinki. May 24-25, 2011

Title: **SKIN INFECTIONS**

Author: Ditte Marie Saunte, MD PhD

Affiliations: Dermatology Dept. Gentofte University Hospital, Denmark.

Abstract text:

Fungal infection of the skin is a very common condition. The clinical picture depends upon the fungal pathogen involved and the host immune response. Dermatophyte infection of the skin causes tinea or ringworm. The dermatophyte is an obligate pathogen whilst *Candida* and *Malassezia* are regarded as commensal microbes and given a change in the host immune response or the environment (e.g. moisture), they may switch from being colonizers to causing a real infection. Non-dermatophyte moulds are rarely involved in skin infections except in immuno-compromised patients or after trauma. Many cutaneous fungal infections can be treated with topical applications and others may require systemic therapy.

This session will focus on the epidemiology and clinical presentation of dermatophytes, *Malassezia* and *Candida* related skin infections. Diagnostic approaches and treatment guidelines will be given.

Abstract. 8th NSMM meeting in Helsinki. May 24-25, 2011

Title: **NAIL INFECTIONS**

Author: Ditte Marie Saunte, MD PhD

Affiliations: Dermatology Dept. Gentofte University Hospital, Denmark.

Abstract text:

Fungal nail infections, onychomycosis, are covering up to 50% of all nail diseases with a prevalence of 3-13% in the Nordic countries [1-3]. The most prevalent pathogens of the nail are the dermatophytes, mainly *T. rubrum* and *T. mentagrophytes*. Candidosis ungvius, *Candida* infection of the nail, covers approximately 20% of the fungal nail infections and it is often associated with paronychia of the fingernails in patients working in a wet environment [3]. Onychomycoses caused by moulds is rarer and the isolation of a mould should be confirmed by a re-sampling from the same nail. The prevalence of onychomycosis increases with age. Diseases such as HIV and diabetes mellitus are predisposing factors but also environmental factors such as attending sports facilities are considered risks. Even though the condition is common many doctors find it difficult to interpret the results of the mycological test. In order to acknowledge this need, this presentation will provide an overview of the epidemiology, a short and practical introduction to the diagnostic methods and the interpretation of the results as well as an update on the treatment of onychomycosis.

Reference List

1. Heikkila, H. & Stubb, S. (1995) The prevalence of onychomycosis in Finland. *Br. J. Dermatol.* **133**, 699-703.

2. Petrini, B. (2004) Behandling av ytliga mykoser - epidemiologi och smittvägar. *Information från Läkemedelverket* **6**, 19-21.

3. Svejgaard, E. L. & Nilsson, J. (2003) Onychomycosis in Denmark: prevalence of fungal nail infection in general practice. *Mycoses* **47**, 131-135.

Abstract. 8th NSMM meeting in Helsinki. May 24-25, 2011

Title: **RAPID IDENTIFICATION OF YEAST SPECIES BY THE PCR- AND MICROARRAY-BASED Prove-it™Sepsis ASSAY**

Authors:
Aittakorpi Anne A (1), Kuusela Pentti I (2), Koukila-Kähkölä Pirkko (2), Vaara Martti S (2), Petrou Michael A (3), Gant Vanya A (4), Mäki Minna M H (1)

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(1) Mobidiag Ltd, Finland, (2) Division of Clinical Microbiology, Department of Bacteriology, HUSLAB, Helsinki University Hospital, Finland, (3) Hammersmith Hospital, Imperial Healthcare NHS Trust, UK, (4) Department of Clinical Microbiology, University College London Hospitals NHS Foundation Trust, UK

Abstract text:

Backgound

Prove-it™ Sepsis, is a rapid PCR- and microarray-based assay platform with proven excellent diagnostic performance for most bacterial pathogens causing sepsis. We have extended this platform's diagnostic range to include 13 yeast species and evaluated its performance against a large number of fungal isolates.

Materials and Methods

159 classically speciated (Germ tube, growth on Corn Meal Tween 80, API 20 AUX and API 32C as well as molecular when all failed) clinical fungal isolates were tested. The isolates were cultured on Sabouraud dextrose agar with penicillin for 48 h aerobically at 35 °C and blindly tested using the Prove-it™ Sepsis assay after DNA extracted with an easyMAG (bioMérieux). Original routine identifications of the clinical samples were revealed after the analysis.

Results

151 out of 159 samples yielded a microarray-based result, all of which were correct; 8 were negative. The microarray correctly identified 30% as *Candida albicans*, 19% as *C. glabrata*, 14% as *C. parapsilosis*, 9% as *C. tropicalis*, 4% as *C. krusei*, 3% as *C.guilliermondii* and 1% as *C.lusitaniae*. 12 % (19/159) of the organism panel were correctly assigned to a pan-yeast group, designed to identify *C. kefyr*, *C. haemulonii*, *C. norvegensis*, *C. dubliniensis*, and *Saccharomyces cerevisiae*. *Cryptococcus albidus, C. neoformans, Trichosporon asahii, T. mycotoxinivorans, T. mucoides,* and *T. inkin* were not identified by this system.

Discussion

We have modified and extended the Prove-it Sepsis array platform to detect almost all clinically relevant fungi. As previously reported for over 50 bacterial species, the addition of rapid and accurate yeast identification to this diagnostic platform will now allow faster, more evidence-based choice of antifungal agent and better patient outcomes.

Sponsors

The Finnish Society of Medical Mycology and the NSMM would like to thank the following sponsors for their generosity in providing donations to allow us to organize this meeting: