ISBN 1188–4169

Canada Communicable Disease Report

FAX

Vol . 22-9

Date of publication: 1 May 1996

Contained in this FAX issue: *(No. of pages: 5)*

For reference purposes, citing should refer to the page numbers of the printed copy and not to those of the FAX copy (F-#).

NATIONAL MYCOLOGY STRATEGIC PLANNING WORKSHOP

I. INTRODUCTION

The Laboratory Centre for Disease Control (LCDC) and the National Reference Centre for Human Mycotic Diseases organized a meeting in November 1995 to develop plans for a National Laboratory Network for Human Mycotic Diseases and to identify areas of public health surveillance and research in Canada that would benefit from such a network. Participants* at the meeting included researchers from the Canadian mycology community, epidemiologists and dermatologists.

This report summarizes the information presented and the statements and recommendations reached at this workshop.

II. MEDICAL MYCOLOGY CLINICAL SERVICES AND RESEARCH IN CANADA TODAY

Laboratory Services Branch, Ontario Ministry of Health

In 1992, the top five fungal species causing deep invasive infections identified by positive cultures by the Laboratory Services Branch were *Cryptococcus neoformans* (28 cases), *Blastomyces dermatitidis* (20), *Sporothrix schenckii* (18), *Histoplasma capsulatum* (11) and *Coccidioides immitis* (5). Cases of *B. dermatitidis* in the province have been identified in both humans and canines. *B. dermatitidis* is endemic to large portions of the boreal forest of Northern Ontario.

Between 1975 and 1984, the Branch received 170,000 cutaneous specimens from Ontario and out-of-province dermatologists; approximately 30,000 (17.6%) of these were positive for dermatophytes. An increase in the incidence of *Trichophyton tonsurans* has been noted in the greater Toronto area, but the organism remains limited to the city's African immigrant population. There has also been a gradual increase in the incidence of *T. soudanense* in the province since 1991, again limited to the African immigrant population.

The Branch does not receive all suspect fungal specimens or reports of positive cases occurring in the province. Many medical facilities have their own mycology laboratories and only consult with the Branch on referrals. The Branch uses telemedicine programs to communicate and hold medical mycology workshops with these auxiliary laboratories. Because some medical facilities send their specimens out-of-province for diagnosis, it is difficult to determine the prevalence of many laboratory-confirmed fungal diseases in Ontario.

Laboratoire de santé publique du Québec

About 50% of the approximately 140 medical laboratories in Quebec carry out some type of fungal testing. The *Laboratoire de santé publique du Québec (LSPQ)* acts as a reference laboratory to these laboratories and does not process primary clinical specimens. It identifies 1,000 to 15,000 fungal strains annually; approximately 25% of these are dermatophytes (with *T. rubrum* and *T. mentagrophytes* comprising 63% and 15%, respectively), 20% are yeast spp. (principally *Candida albicans* 44%, *C. glabrata* 11%, *C. krusei* 9%, and *C. tropicalis* 7%), and 1.4% are dimorphic spp.

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(primarily *H. capsulatum* and *B. dermatitidis*). Most yeast strains received by the LSPQ are sent for antifungal susceptibility testing.

The medical mycology workshops, presented by the LSPQ three to five times a year, are attended by clinicians and laboratory personnel from across the province, as well as by university and medical students. Seven years ago, LSPQ instituted a proficiency testing program for medical mycology laboratories in the province. Twice a year a shipment of five specimens, including pure cultures and 'spiked' medical samples, is sent to each participating laboratory. Seventy-two (> 95%) of the provinces's laboratories participate in this program.

Canadian Studies of Deep Fungal Infections

In 1993, Pfizer Canada, through the Canadian Infectious Disease Society's network, sponsored an investigation into the extent and prevalence of invasive fungal infections in Canada. The reporting phase of the study was completed in 1994.

Seven hundred and fifty-one cases of deep fungal infections were recorded from across Canada. The major organisms involved were *Candida* spp. [478 (63.6%) of the cases]; *C. neoformans* [72 (9.6%)]; *Aspergillus* spp. [60 (8.0%)]; *B. dermatitidis* [24 (3.2%), the majority being reported from Manitoba, but 6.0% of these cases were from Ontario]; and *H. capsulatum* [52 (6.9%), with the majority (70%) being reported from Quebec].

Although reporting by participating centres varied across Canada, the study has provided a 'snapshot' of deep fungal infections in Canada, which will help identify key areas for future surveillance studies, and has highlighted some of the problems with specimen submission and fungal disease reporting in the country. Data from the four areas with the most complete reporting (Quebec, Manitoba, and the Ottawa and Hamilton regions of Ontario) are being analyzed to estimate the prevalence of invasive fungal infections.

National Reference Centre for Human Mycotic Diseases

The National Reference Centre in Edmonton, Alberta, receives referral specimens from across Canada with the majority coming from Alberta, British Columbia, and Ontario. The Centre performs approximately 1,400 tests per year; 70% of these are for serologic investigation of deep mycoses and for fungal-related-broncho-pulmonary disease (e.g., farmer's lung, allergic aspergillosis), 18% for identification, and the remaining 12% for antifungal susceptibility testing.

The Centre is committed to maintaining and, where possible, improving the response time for specimens received from referring laboratories. Areas for improvement will be identified through the results of a questionnaire distributed to the Centre's clients and increased direct communication with the clinicians submitting specimens. The Centre is also attempting to reduce the time required to send specimens.

Over the next 2 to 3 years, the National Reference Centre will focus on the following areas: developing ongoing surveillance systems for fungi of epidemiologic importance and altered antifungal susceptibilities; standardized methodologies for serologic testing of filamentous fungi, including a complement fixation test for serologic confirmation of deep fungal infections; specific nucleic acid probe-based technologies for diagnosis of invasive fungal infections; methods to rapidly recognize *Candida* spp. (e.g., *C. krusei*) that are likely to be more resistant to new triazole antifungal agents, and to study the molecular phylogeny of fungi; and determining any correlation between the clinical outcome of patients treated with antifungal agents and antifungal susceptibility testing of yeasts and dermatophytes.

The Centre is committed to providing educational programs to help improve the quality of diagnostic mycology in Canada. It is also working to develop better quality proficiency testing materials to be used in conjunction with existing proficiency testing programs in Canada.

III. DEVELOPMENT OF A NATIONAL LABORATORY NETWORK FOR MYCOTIC DISEASES

Recommendations

General

1. A formal national laboratory network for human mycotic diseases should be created with the goal to increasing communication and facilitating the development of cooperative studies and surveillance programs among Canadian mycology laboratories.

Membership

1. The network membership should initially be extended to the National Reference Centre and the major mycology laboratories in Canada and to representatives from specific clinician groups (e.g., Canadian Infectious Disease Society, Canadian Society for Medical Mycology, and the Canadian Association for Clinical Microbiology and Infectious Diseases). Membership may be expanded as a result of new cooperative studies and surveillance programs with other groups and laboratories.

Coordination

1. The network should function under the direction of the National Reference Centre and communication and monitoring of ongoing projects within the network should be coordinated by a steering committee consisting of three to four professionals from network laboratories.

Funding

1. The National Reference Centre should provide funding for the network's infrastructure, although additional funding for research and surveillance programs may be sought from external sources, such as LCDC, the pharmaceutical and biochemical industries, and partnerships with other agencies.

Communication

1. The network should develop a national inventory of available facilities and expertise as soon as possible by contacting the major mycology facilities for information on current mycotic laboratory resources available; mycotic research activities currently being undertaken; location, telephone and fax numbers, and e-mail addresses of facilities; their interest in joining such a network; and other services or research facilities that should be included in the inventory.
2. Copies of the inventory should be circulated to the polled facilities, published in the Canadian Society for Medical Mycology (CSMM) newsletter, and made available on the Internet.

3. The network will investigate the possibility of expanding the publication of the CSMM newsletter and using it as a forum for updating network members and the professional community at large on the progress and findings of network members.

AREAS OF RESEARCH AND SURVEILLANCE FOR THE MYCOLOGY NETWORK

Mycology Laboratory Standardization

Currently, many diagnostic and susceptibility results performed on replicate samples by different mycology laboratories in Canada vary considerably.

Recommendations

1. The network should coordinate multi-laboratory research programs to standardize mycology assays performed in Canada. Replicate specimens with a standardized protocol could be sent to three or more laboratories across the country to evaluate the efficiency and specificity of the protocol and to indicate possible improvements to it.
2. The network should establish a similar system to perform efficient quality control tests on reagents used in mycology assays and to identify those that provide reliable results.
3. The network should publish the findings of these studies, recognizing the contributions of all the laboratories involved in the studies.
4. Through its inventory, the network should facilitate education and upgrading of laboratory personnel in the standardized protocols by identifying appropriate training programs.
5. In conjunction with the National Reference Centre, the network should also help to coordinate and distribute proficiency testing programs to interested laboratories across Canada.

Yeasts

Yeast species are the most common causes of invasive fungal infections. Currently, concerns exist over changes in the prevalence of disease-causing species and increasing antifungal drug resistance in many of these. Epidemiologic studies have identified that azole-resistant strains of ***Candida*** are potentially communicable between immunosuppressed patients.

Recommendations

1. The network should evaluate data on ***Candida*** blood culture isolates from provincial mycology laboratories to provide a national overview of the prevalence and the degree of antifungal susceptibility of the different species.
2. The network should monitor susceptibility trends of specific yeast species and inform clinicians and laboratory personnel in a timely manner of any increase in resistance.
3. The network may release position papers on practice guidelines regarding optimal use of antifungals, benefits and hazards of antifungal prophylaxis, and strategies to reduce or contain drug resistance in yeast species.

Nosocomial Infections

Few standards exist for air quality control for airborne fungi in Canadian hospitals. Airborne fungi are common in the environment, yet they only rarely appear to cause human infection. Of particular concern for many hospitals are fungal infections in bone marrow transplant patients and other immunocompromised hosts.

Recommendations

1. Through analysis of known Canadian mycotic outbreaks, the network should consider making recommendations on methods to minimize the chances of fungal infection within bone marrow transplant units and other hospital locations.
2. The network should facilitate rapid identification and confirmation of nosocomial outbreaks by identifying reference laboratories within Canada able to perform molecular typing of the species involved.
3. The network should facilitate studies in the rapid diagnosis of invasive fungal infections, particularly candidiasis and aspergillosis.

Dermatophytes

The costs of clinical diagnosis and identification of dermatophytes involved in infection are quite high. Physicians usually prescribe treatment based on symptomatology alone. Identification and reporting of dermatophyte outbreaks would be beneficial to public health personnel and clinicians.

Recommendations

1. The network should set up a monitoring program to identify outbreaks of dermatophyte infection in Canada.
2. The network should consider organizing a public campaign to increase awareness on preventive measures against dermatophyte infections.

Endemic Deep Fungal Infections

A national system to collate information on endemic deep fungal infections does not currently exist.

Recommendations

1. The network should establish a monitoring program to identify outbreaks of invasive fungal infection in Canada.
2. The network should aid the National Reference Centre in the collation of information and the collection of isolates from deep fungal infections by providing improved channels of communication and specimen transport within the national mycology community.

Dimorphics

The organisms causing blastomycosis and histoplasmosis are known to be endemic in regions of Northern Ontario, Manitoba, and Quebec.

Recommendations

1. The network should map the endemic areas of *Blastomyces* and *Histoplasma* cases.
2. The network should consider acting as a bridge between the mycology and veterinary communities to help correlate data on *Blastomyces* and *Histoplasma* spp. and further define endemic areas.

3. Once endemic areas are identified, the network should be used to inform inhabitants and physicians within these areas about these diseases and the preventive measures that can be taken.

SUMMARY

Unanimous support was expressed for the creation of a formal network among Canadian medical mycology laboratories in order to increase communication and facilitate the development of co-operative studies and surveillance programs. Steps were identified for an interim steering committee to take to expedite the creation of this network.

These proceedings and recommendations will be reprinted in the CSMM Newsletter.

SECRETARIAT: *Ms. S. Paton, Chair; Dr. R. Rennie, Dr. J Spika, Dr. F. Ashton, Mr. D. Dragon, Ms. F. Roback-Jones.*

Notice

RE: SUBSCRIPTIONS TO THE CANADA COMMUNICABLE DISEASE REPORT (CCDR)

As you are all aware, beginning in January 1996, the CCDR is now being printed, marketed and distributed by the Canadian Medical Association. This includes the management of subscriptions.

If you renewed your subscription for 1996 with the previous publisher, the Canada Communication Group (CCG), sometime in 1995, you have probably received a notice from CCG indicating that your subscription was valid until 31 December, 1995. Included with this notice should be a credit for the balance of your paid subscription. In order to receive a refund, you must call **(819) 997-4170** and quote your credit number. A refund should be forthcoming in the mail.

To renew your subscription, contact the **Information Technology Group, Canadian Medical Association, P.O. Box 8650, Ottawa, Ontario, K1G 0G8, Tel: (613) 731-9331, ext. 2028 or Fax: (613) 731-9102.**

The subscription rates are the same as last year: $75.00 + G.S.T. - in Canada; $97.50 (US) - outside Canada.

We apologize for any inconvenience this may have caused you.

Erratum

NACI: SUPPLEMENTARY STATEMENT ON HEPATITIS A PREVENTION, VOL. 22-1, PAGE 2

In the last sentence of the first paragraph of the section entitled *Vaccine Use in Children*, the last word should be **1.0 mL** and not 0.1 mL.

Announcements

Canadian National Immunization Conference
IMMUNIZING FOR HEALTH: ACHIEVING OUR NATIONAL GOALS
8-11 December, 1996
The Royal York Hotel, Toronto, Ontario

Call for Abstracts

This 4-day conference, organized by the Laboratory Centre for Disease Control and the Canadian Paediatric Society, with support from the private sector, primarily will focus on childhood immunization. Issues such as vaccine supply and delivery, education, assessment of vaccine programs, regulations and legislations, and global immunization efforts will be discussed. The progress towards the achievement of recently established Canadian national goals for the reduction of vaccine-preventable diseases of infants and children will also be examined.

Time has been allotted within the conference for peer- reviewed presentations (poster and oral) that relate to the objectives of the conference. Health units are encouraged to present material related to education and promotion. Deadline for submitting abstracts is **31 July, 1996**.

The program has been approved for continuing education credits from the Royal College of Physicians and Surgeons of Canada, and the College of Family Physicians of Canada. Members of the *Fédération des médecins omnipracticiens du Québec* may claim credits through the College of Family Physicians of Canada.

To obtain additional information, a registration package and an abstract submission form, contact **Mr. C. Schouwerwou, Conference and Committee Coordinator, Division of Immunization, Bureau of Infectious Diseases, Laboratory Centre for Disease Control, P.L. 0603E1, Tunney's Pasture, Ottawa, Ontario, K1A 0L2, FAX: (613) 998-6413**.

INTERNATIONAL TRAVEL AND HEALTH
Vaccination Requirements and Health Advice

The 1996 edition of ***International Travel and Health*** has just been published in English and French. This booklet is addressed to national health administrations and to practising physicians, tourist agencies, shipping companies, airline operators, and other bodies who are called upon to give health advice to travellers.

In addition to summarizing the vaccination requirements of individual countries, the booklet indicates the main areas where malaria transmission occurs and where *Plasmodium falciparum* is resistant to drugs. The recommended chemoprophylactic regimen is also given for each country with malarious areas.

This booklet can be obtained from the **Publications Department, Canadian Public Health Association, 400-1565 Carling Avenue, Ottawa, Ontario, K1Z 8R1, (telephone: (613) 725-3769)**. Price per copy is $18.67 (including postage, handling and GST).

TIMING OF THE SECOND DOSE OF MEASLES VACCINE IN A TWO-DOSE PROGRAM

In the *Guidelines for Control of Measles Outbreaks in Canada*, issued by the Advisory Committee on Epidemiology and published in the CCDR 1995;21:189-95, it is indicated, in the third paragraph under *Immunization* on page 190, that the second dose of vaccine should be given before school entry, at least 3 months after the first. This recommendation was based on information available at the time of the Consensus Conference on Measles, held at the end of 1992. Based on additional information available in 1993, the recommendation by the National Advisory Committee on Immunization (NACI) in the 1993 edition of the *Canadian Immunization Guide* was for a shorter minimum interval. This was restated in NACI's recent *Supplementary Statement on Measles Elimination in Canada* (CCDR 1996;22:9-15) as follows: ***"A second dose of MMR vaccine should be offered routinely at least 1 month after the first dose, to raise protection rates as high as possible"***. Therefore, all references to the timing of the second dose of measles vaccine should reflect this most recent NACI recommendation.

LOW OSMOLAR DYE ADVISORY NOTICE

The purpose of this clarification is to explicitly state that the National Steering Committee on Infection Control Guidelines *does not endorse* the use of backflow valves in low osmolar dye delivery systems. The recent updated notice [CCDR 1996;22:31-2 (16 February)] should not be interpreted as such. The practice of using single use, low osmolar dye delivery systems on more than one patient **WILL ALWAYS** present a risk of blood and body fluid cross contamination between patients and cannot be recommended. The purpose of the 16 February Advisory Notice was to provide information on potential risk reduction strategies, and to highlight the need for further critical evaluation of these systems.

Source: *The National Steering Committee on Infection Control Guidelines, LCDC, Health Canada.*

The Canada Communicable Disease Report (CCDR) presents current information on infectious and other diseases for surveillance purposes and is available through subscription. Many of the articles contain preliminary information and further confirmation may be obtained from the sources quoted. Health Canada does not assume responsibility for accuracy or authenticity. Contributions are welcome (in the official language of your choice) from anyone working in the health field and will not preclude publication elsewhere.

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Submissions to the CCDR should be sent to the Editor-in-Chief at the following address: Laboratory Centre for Disease Control, Tunney's Pasture, Ottawa, Ontario K1A 0L2.

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