ILLINOIS DEPARTMENT OF PUBLIC HEALTH

Illinois Infectious Disease Report

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A Cluster of 18 Cases of Myopericarditis in Adults including Two Deaths

By Gregory Huhn, M.D., M.P.H. and T.M.

Introduction

Acute myocarditis and pericarditis, referred to collectively as myopericarditis, are diseases characterized by inflammatory infiltrates of the myocardium and pericardium, respectively. Acute disease has been attributed to multiple infectious and noninfectious etiologies, but viruses, particularly the enteroviruses group B coxsackievirus and echoviruses, are believed to be the most common agents of infection in the United States. An infectious cause of myopericarditis is usually suspected in the setting of unexplained heart failure or arrhythmia following a systemic febrile illness or upper respiratory tract infection. Acute myopericarditis is typically sporadic, though clusters have been reported during outbreaks of viral disease. Most cases of myopericarditis are idiopathic without a known etiology. Myocardial or pericardial tissue biopsy specimens for pathologic examination, the gold standard for diagnosis are infrequently collected in nonfatal cases. Often, viruses are not successfully cultured from tissue specimens, though viral nucleic acid identification by polymerase chain reaction (PCR) assays on myocardium have recently enhanced viral detection. Viral serology and PCR tests of blood, stool, urine and nasopharyngeal specimens are adjunctive techniques for diagnosing myopericarditis that have not been validated.

On March 21, 2003, the Kane County Health Department (KCHD) was notified of six cases of presumptive myocarditis and one case of pericarditis that occurred in patients hospitalized in Kane County, Illinois, within a two-week period (February 26 to March 10). Five cases were younger than 50 years of age, one of whom died within 24 hours of hospitalization. Five of the cases were hospitalized. The Illinois Department of Public Health (IDPH) and KCHD initiated an investigation to identify additional cases and to determine the cause of illness. This report summarizes the findings of the investigation.

Methods

Case Finding

On March 22, IDPH distributed a notice describing the cluster of myopericarditis cases to all local health departments and regional IDPH offices, hospital infection control practitioners, hospital emergency departments, hospital laboratories and infectious disease specialists in Illinois to request urgent reporting of similar cases to IDPH. At the hospital where the majority of the initial cases were diagnosed, active surveillance was instituted for patients with a clinical syndrome consistent with myocarditis or pericarditis or an upper respiratory tract illness with profound fatigue and/or disproportionate shortness of breath of >2 weeks duration. For suspect cases, a testing protocol was implemented, including 2-D echocardiogram, electrocardiogram, chest X-ray, serum cardiac enzymes and complete blood count, in addition to nasopharyngeal, stool, and urine samples for enterovirus assays, and acute and convalescent serology for enterovirus.

A review of all records for patients with discharge diagnoses of myocarditis, pericarditis or cardiomyopathy at all five hospitals in Kane County during a six-month period (October 1, 2002, through March 31, 2003) was performed to find unreported cases of myopericarditis. Ischemic, alcoholic, postpartum and chronic cardiomyopathy cases were excluded. To determine the background number of myopericarditis cases for all patients younger than age 50 years of age at Hospital A, a database search of medical records during a two-year period (October 1, 2000, to September 30, 2002) was performed by principal ICD-9 discharge diagnosis codes.

Investigation of Cases

A case of myopericarditis was defined as 1) a person with myocarditis or pericarditis diagnosed by electrocardiogram, echocardiogram or cardiac catheterization without apparent cause or 2) myocardial or pericardial inflammatory infiltrates on tissue pathology or 3) viral isolation or nucleic acid identification in myocardial or pericardial tissue specimens in persons living in northern Illinois from October 1, 2002, through May 30, 2003.

Medical records of cases were reviewed and physicians who treated case-patients were interviewed when available. Information was collected on patient demographics; antecedent illness; underlying medical condition; exposure to toxins, pets or ill humans; recent travel; and smallpox vaccination history.

Laboratory Investigation
The results of echocardiograms, routine and specialized laboratory tests, including enterovirus and adenovirus PCR and IgM EIA tests conducted by the California Department of Health Services Viral and Rickettsial Disease Laboratory, were recorded. Nasopharyngeal, urine and stool specimens from case-patients were cultured for enterovirus by the IDPH laboratory. Pathology reports on autopsy specimens in fatal cases and myocardial biopsy specimens in non-fatal cases were reviewed.

Results
Case Finding
A total of 18 cases - 15 myocarditis cases, two pericarditis cases and one myopericarditis case - were identified. Among these cases, 17 were reported by clinicians and one was identified through review of discharge diagnoses from the five Kane County hospitals. All case-patients were hospitalized and admitted between January 28 through April 7, 2003, and 15 cases (83%) were in adults younger than 50 years of age. Seven of the 18 case-patients (41%) were hospitalized at Hospital A between January and March. The background number of diagnoses of myopericarditis in patients younger than 50 years of age (10 patients) at Hospital A from October 1, 2000, to September 30, 2002, was less than one per month.

Investigation of Cases
The median age for case-patients was 38 years (range, 18 to 70 years). Ten case-patients (56%) were male. Among the 18 case-patients, four (22%) were residents of Kane County, 10 (56%) were from six counties bordering Kane County, and four (22%) were from four other counties in northern Illinois.

Fourteen cases (78%) had an acute viral-like illness within one month before onset of myocarditis or pericarditis. Two female case-patients, ages 26 and 39 years, presented with ventricular fibrillation requiring automatic interventricular cardiac defibrillator (AICD) implantation and recovered. There were two deaths.

No common exposures to medications, food, toxins, occupational hazards or pets could be identified among the case-patients. There were no common travel histories among the case-patients. None of the case-patients had recently been vaccinated for smallpox.

Laboratory Investigation
Information on acute serologic testing for group B coxsackievirus performed at hospitals was known for six cases. Three case-patients had elevated antibody titers to group B coxsackievirus, two of whom also had positive antibody titers to echovirus and mycoplasma, respectively.

IDPH laboratory cultured nasopharyngeal (n=6), urine (n=7), stool (n=7) and myocardial tissue (n=1) specimens from nine case-patients for enterovirus viral isolation. All cultures were negative. Among specimens (sera from 12 case-patients and myocardial tissue from two case-patients) tested for enterovirus and adenovirus by PCR and EIA, all were negative.

For the two fatal autopsy cases, the primary diagnosis was acute myocarditis based on characteristic lymphocytic infiltrates and inflammation on histopathology. Results for influenza A and B and hantavirus were negative for tissue specimens from one autopsy case.

Discussion
An outbreak of myopericarditis of unknown etiology occurred in adults in Kane County and adjacent areas during the winter and early spring of 2003. A majority of the cases were hospitalized in March and approximately 40 percent of all case-patients were hospitalized at Hospital A, one of five hospitals in Kane County (population 400,000). Surveillance for myopericarditis cases was initiated throughout Illinois in March and April, though clustering of cases was only evident in and limited to Kane County and surrounding communities during the investigation period. Myocarditis and pericarditis are not notifiable conditions in Illinois, but an increase in incidence of diseases of unknown or unusual etiology is reportable to local health departments and IDPH. The reporting of myopericarditis cases from other counties may have reflected baseline rates of idiopathic myopericarditis in those populations that only came to the attention of public health officials through enhanced surveillance.

There were no common exposures identified among the cases. The outbreak occurred within the same time period that adverse events of myopericarditis following smallpox vaccinations among military and health care personnel in the United States, including Illinois, were being reported; however, no case-patients in this outbreak had recently been immunized with the smallpox vaccine. The outbreak was unusual in that it did not coincide with any recognized increase of seasonal viral illness in any of the counties. Most illnesses were preceded by a prodrome that suggested that the outbreak was viral in origin. There was significant morbidity and mortality among these reported cases. All reported case-patients were hospitalized, two required AICD devices and there were two deaths, a reminder of the severe sequelae associated with this illness and the rationale for this public health investigation.

Despite extensive efforts to identify a causative organism, including serologic, PCR, IHC and viral isolation tests on submitted specimens, no specific agent was identified. Cross-reactivity of group B coxsackievirus serology with other viral or mycoplasma agents was apparent from initial laboratory tests performed at hospitals. These results were insufficient to support a specific etiology of illness. The inability to implicate a responsible agent is not an uncommon outcome of myopericarditis outbreak investigations.

The outbreak highlighted the usefulness of dissemination of information by public health authorities to the health care community on unusual clusters of illness as all but one case were identified by clinicians actively reporting suspicious cases to the state health department. In the absence of a known vehicle for infection, appropriate hand hygiene and handwashing practices for hospital personnel and patients discharged from hospitals treating case-patients was encouraged in order to prevent transmission of a presumed viral agent. Prevention of future outbreaks will be augmented by a better understanding of myopericarditis through increased awareness of possible clusters of illness, rapid case reporting to public health departments, encouraging appropriate tissue collection for testing (particularly endomyocardial specimens in patients with unexplained cardiomyopathy for whom biopsy procedures are deemed safe) and research to enhance diagnostic techniques.

Invasive Pneumococcal Disease: A Survey of Hospital Laboratory Practices and Quantitation of Underreporting in Illinois

By Sarah Starks, M.S., and Mark Dworkin, M.D., M.P.H.T.M.

Invasive pneumococcal disease continues to be a significant cause of morbidity and mortality in the United States. In 2000, a study performed by the U.S. Centers for Disease Control and Prevention (CDC) in eight states (not including Illinois) identified 4,265 cases and 460 deaths attributed to infection with *S. pneumoniae* in a population totaling 19,068,593 persons. Based on U.S. Bureau of the Census data for 2000, projections for Illinois would be 2,500 cases annually with 278 deaths. However, a review of data collected in the new (2001) invasive pneumococcal disease surveillance system demonstrated that only 701 cases were reported during a 12-month period (April 2001 to March 2002). Among the 597 case reports where outcome was indicated, there were 94 deaths.

Pneumococcal disease is preventable with a safe and effective vaccine. The Illinois Department of Public Health (IDPH) Division of Infectious Diseases is closely examining the invasive pneumococcal disease surveillance system to strengthen it and better understand its limitations. A review of hospital laboratory practices regarding antimicrobial resistance testing of *S. pneumoniae* is part of this examination. This component is very important because results of antimicrobial resistance testing are reportable to IDPH and they provide valuable information on emergence of antibiotic resistance patterns in Illinois.

In March 2003, IDPH conducted a survey of all Illinois hospital laboratories to examine laboratory practices for invasive *S. pneumoniae* antimicrobial susceptibility testing and reporting. A standardized survey was faxed to each hospital laboratory director. Completed surveys were returned via fax or by mail. Non-responders were faxed another survey and were contacted by telephone.

There were 174 (83%) respondents among 209 hospitals surveyed. Of these, all hospitals reported

performing susceptibility testing on *S. pneumoniae* either in-house (72%) or at a reference laboratory (28%). Almost all of the laboratories reported testing *S. pneumoniae* from blood (99%), CSF (98%) and other sterile sites (80%) (Table 1).

A total of 173 laboratories responded to questions pertaining to oxacillin disk screening of pneumococcal isolates from blood, CSF or other sterile sources. Of these, 59 (34%) reported performing oxacillin disk screening while 114 (66%) reported no oxacillin disk screening (Table 2). MIC or disk diffusion tests were performed on all isolates at 90 (82%) of the laboratories that bypassed initial oxacillin screening [a recommendation by the National Committee for Clinical Laboratory Standards (NCCLS) for blood and CSF isolates.] Of the laboratories that performed MIC or disk diffusion testing in-house or at a reference laboratory, 163 (96%) tested sterile site pneumococcal isolates for resistance to penicillin, 158 (93%) tested a third generation cephalosporin (cefotaxime or ceftriaxone) and 151 (89%) tested for resistance to vancomycin (Table 3). In addition, 139 (82%) laboratories reported testing the three antimicrobials (penicillin, cefotaxime/ceftriaxone and vancomycin) recommended by NCCLS for blood and CSF isolates. Most laboratories reporting using the broth microdilution method for penicillin (86%) and vancomycin (78%), while disk diffusion was used more often for cefotaxime or ceftriaxone (83%) (Table 4).

A total of 1,872 isolates were identified during April 2001- March 2002 and, of these, only 701 (37%) were reported to the IDPH invasive pneumococcal disease surveillance system (Figure 1).

Initial oxacillin-disk screening may delay definitive MIC results by >24 hours. It is important for hospital laboratories to be familiar with the NCCLS recommendations, including the one that laboratories by-pass initial oxacillin-disk screening when testing pneumococcal isolates from blood, CSF or other sterile isolates. NCCLS also recommends that laboratories conduct susceptibility testing of all isolates from blood or CSF against penicillin, cefotaxime or ceftriaxone, and vancomycin.

This report summarizes reporting of invasive pneumococcal disease during a time period soon after it was made a separately reportable illness. Prior to April 2001, pneumococcal disease was reportable only as one of the causes of bacterial meningitis.

Table 1: Number and percentage of laboratories that performed susceptibility testing on pneumococcal isolates, in-house or at a reference laboratory, by source (n=173)

Source	Always tested No. (%)	Tested on request No. (%)	Not tested No. (%)
Blood	171 (99)	2 (1)	0 (0)
CSF	169 (98)	2 (1)	2 (1)
Other sterile site	170 (98)	2 (1)	1 (<1)
Sputum	139 (80)	32 (18)	2 (1)
Other non-sterile site	122 (71)	44 (25)	7 (4)

Table 2: Number and percentage of laboratories performing oxacillin disk screening of pneumococcal isolates from blood, CSF or other sterile sources (n=173)

Testing procedure	No.	(%)
Oxacillin disk screening performed	59	34
Additional testing performed in-house (n=58)	45	78
Additional testing performed at a reference laboratory (n=58)	25	43
No oxacillin disk screening performed	114	66
MIC or DD performed on all isolates (n=110)	90	82
MIC or DD performed by physician request only (n=110)	7	6
No further testing performed (n=110)	9	8
Other (n=110)	4	4

Table 3: Number and percentage of laboratories testing sterile site pneumococcal isolates, in-house or at a reference laboratory, by selected antimicrobial agents

Antimicrobial Agent	No.	(%)
Penicillin (n=169)	163	96
Cefotaxime or ceftriaxone (n=169)	158	93
Vancomycin (n=169)	151	89
Erythromycin (n=166)	114	69
Fluoroquinolones (n=164)	102	62
Trimethoprim-sulfamethoxazole (n=165)	99	60
Tetracycline (n=166)	84	51
Chloramphenicol (n=166)	80	48
Clindamycin (n=165)	68	41
Cefuroxime (n=164)	56	34
Meropenem (n=167)	56	34
Rifampin (n=163)	17	10
Quinupristin-dalfopristin (n=162)	7	4

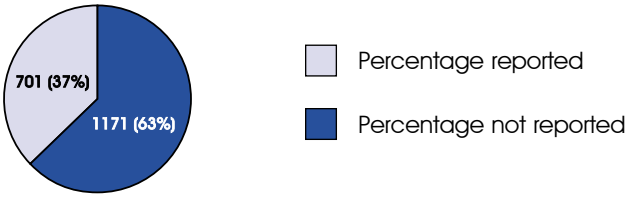
Penicillin, cefotaxime or ceftriaxone, and vancomycin were tested at 139 laboratories (82%) (n=169).

Table 4: Number and percentage*of laboratories testing sterile site pneumococcal isolates, in-house or at a reference laboratory, by testing method

Antimicrobial Agent	Broth microdilution		Etest		Disk diffusion	
	No.	(%)	No.	(%)	No.	(%)
Penicillin (n=160)	86	54	69	43	9	6
Cefotaxime or ceftriaxone (n=155)	83	54	64	41	83	54
Vancomycin (n=145)	78	54	44	30	29	20
Erythromycin (n=111)	70	63	17	15	5	23
Fluoroquinolones (n=99)	46	46	31	31	25	25
Trimethoprim-sulfamethoxazole (n=96)	70	42	8	8	20	21
Tetracycline (n=76)	60	79	2	3	15	20
Chloramphenicol (n=70)	58	83	11	16	4	6
Clindamycin (n=66)	50	78	4	6	14	21
Cefuroxime (n=52)	43	83	7	13	2	4
Meropenem (n=52)	46	88	6	12	1	2
Rifampin (n=13)	8	62	0	0	5	4
Quinupristin-dalfopristin (n=6)	4	67	2	33	0	0

*Some laboratories reported using more than one testing method.

Figure 1: Number and percentage of invasive pneumococcal iolates reported to local/state health department during April 2001- March 2002



Implementing the SISTA (Sisters Informing Sisters About Topics on AIDS) Project

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The incidence of HIV infection in women is growing at a proportionally faster rate than in any other population. According to the U.S. Centers for Disease Control and Prevention (CDC), HIV is growing most rapidly among minorities (especially African Americans and Hispanics), women and heterosexuals. Surveillance data from the Illinois Department of Public Health (IDPH) support this and show a disproportionate number of women with HIV and AIDS are African American and Hispanic; many acquire HIV infection through heterosexual contact. In addition, AIDS is the leading cause of death for African-American women between 25 and 44 years of age, and it is the third leading cause of death for all women in the same age group.

The proportion of all AIDS cases reported among women in Illinois has increased seven-fold, from 3 percent in 1986 to 21 percent in 2002. African-American women make up 69 percent and Hispanic women 11 percent of HIV cases. Between 1999 and 2002, 473 women in Illinois died from HIV/AIDS: 75.3 percent of them were African Americans.

These numbers underscore the pressing need for prevention efforts aimed at helping those who are infected to adopt safer behaviors and those who are at risk to avoid infection. The SISTA (Sisters Informing Sisters About Topics on AIDS) project, a collaboration between the IDPH and the Open Door Clinic in Kane County, is one such effort. Kane County was an appropriate site; in 2002, it reported the second highest number of HIV cases (57 total cases; 18 were female) in the state. The project, which was conducted from December 2002 to January 2004, targeted Kane County women of color (particularly those who lived in Aurora) who were at risk for HIV/AIDS and other sexually transmitted diseases. The women were provided with the knowledge, skills and self-esteem need to actively protect themselves from infection with HIV.

Sexually active, heterosexual women of color between the ages of 15 and 40 years who resided in Kane County and who were at high risk for HIV and STDs were recruited for the project. Included were those who were or had been incarcerated, those who lived in rent-subsidized housing, participants in substance abuse treatment programs, those attending alternative schools, and high school and college women who were considered to be at risk. The 150 women who were recruited were asked to complete an interview survey; 131 surveys were collected (Table 1). From those women completing the survey, 60 were chosen for the SISTA project; 42 actually participated.

The average age of the participants was 31 years. Most (88 percent) were African American, but four white women and one Hispanic woman participated. More than half (58 percent) were single/never married; 19 percent were separated, divorced or widowed. Nearly three-quarters (74 percent) lived in an apartment or home. The rest came from a local work release center. Among those participants with children, the number of children ranged from one to 10 (average, 2.5).

Participants completed a five-week group program, meeting once a week for two hours. During these and two follow-up booster sessions, the women focused on the SISTA project curriculum. They examined issues such as ethnic pride, gender roles, and commitment and communication in relationships. The women were provided with information on ways to reduce their risk of acquiring HIV, on sexual negotiation skills, and on proper and consistent condom use. Of the 42 women who started the program, 33 (79 percent) completed it.* All those who finished the program were tested for HIV (all were negative).

Post-program surveys done three weeks (booster session 1) and seven weeks (booster session 2) later indicated that the women who completed the SISTA project had increased their knowledge of HIV and STDs, and they reported greater use of condoms.

The overall response of the targeted community was positive. However, long-term follow-up is needed to evaluate outcomes.

Ralph J. DiClemente and Gina Wingood developed the SISTA project curriculum. The CDC lists it as a recommended intervention for HIV prevention for heterosexual African-American women; the curriculum can be found in the agency's Compendium of HIV Prevention Interventions With Evidence of Effectiveness (http://www.cdc.gov/hiv/projects/rep/compend.htm). The SISTA project can be tailored or adapted to specific groups, but the core elements must remain intact.

Table 1. Demographic Characteristics from the SISTA Community Survey and Pre-test Participant Survey Results

	Community Survey N = 131	Participant Survey N = 42
Residence	38% corrections 62% home/apartment	26% corrections 74% home/apartment
Race	72% African American	88% African American
Marriage Status	64% single/never married	58% single/never married
Education	40% less than high school 33% high school graduate 27% some college	29% less than high school 45% high school graduate 26% some college
Employment	50% not employed	---
Sexual Orientation	72% heterosexual*	98% heterosexual
Ever had a STD	30% Chlamydia 6% Gonorrhea 8% Genital Warts 7% Herpes	23% Chlamydia 10% Gonorrhea 6% Genital Warts 6% Herpes 13% Syphilis

* The women received a number of incentives to participate: $15 to complete the initial interview survey, $25 per weekly session, and $10 for two post-surveys. In addition to the monetary incentives, participants received "goody bags" at each session, raffle and door prizes, T-shirts, meals, child care, and an unlimited supply of condoms and HIV/AIDs information.

Surveillance is Information for Action: Hansen's Disease

By Mark S. Dworkin, M.D., M.P.H. and T.M. and Carlotta Hill, M.D.*

Q: What public health action is triggered when a case of Hansen's Disease commonly known as leprosy is reported to the local health department?

A: Hansen's disease (leprosy) is a complex infectious disease caused by *Mycobacterium leprae*. Although it has been recognized for more than 2,000 years, the disease is still not completely understood, including how it is spread. Hansen's disease encompasses a spectrum of clinical findings that range from purely localized disease (tuberculoid) to generalized (lepromatous) disease. *M. leprae* bacillus has a predilection for nerves and skin in the cooler areas of the body. Treatment is available but follow-up may be complicated by adverse drug reactions and immunologic phenomenon requiring monitoring by a clinician very familiar with the disease. As many as 50 percent of patients may experience acute exacerbations of tissue destructive inflammatory processes (termed reactions), which can be a major cause of nerve damage, during the course of their illness. Reactions are caused by an immune response to bacterial antigens released when bacilli are destroyed; they may occur before, during or after completion of treatment. Treatment of reactions may involve the use of corticosteroids and thalidomide. A good review of this disease was authored by Leo Yoder, M.D., formerly of the Gillis W. Long Hansen's Disease Center in Carville, Louisiana (Current Opinion in Infectious Disease 1991;4:302-8).

Treatment of Hansen's disease is directed at the infection and, if present, the reactional state as well. The National Hansen's Disease Center's regimens are of longer duration than those espoused by the World Health Organization.

The National Hansen's Disease Center's regimens are as follows:

Paucibacillary (indeterminate, tuberculoid), 1 year
Dapsone 100 mg daily
Rifampin 600 mg daily
Multibacillary (borderline, lepromatous), 2 years
Dapsone 100 mg daily
Rifampin 600 mg daily
Clofazimine 50 mg daily

Immigrants make up nearly all of reported cases in the United States with 464 cases in 1983 (a peak year), falling to 240 cases in 1990 and 96 cases in 2002. Native-born cases in the United States have been reported in residents of Hawaii, Louisiana and Texas.

Illinois' communicable disease control rules state that contact isolation or an equivalent isolation procedure is required during hospitalization for lepromatous leprosy but no isolation is required for tuberculoid leprosy. Patients are considered non-infectious after three months of continuous treatment with dapsone or clofazamine or after three days of continuous treatment with rifampin. There are no restrictions for contacts. However, contacts should be examined for secondary cases because it is not uncommon for family members to become infected. Such contacts should be examined initially at the time the case is discovered; periodic examinations at yearly intervals should continue for five years after the last contact with an infectious case.

If a laboratory identifies a case infected with *M. leprae*, it should be reported to the local health authority. Cases of leprosy (infectious and non-infectious cases) must be reported to the local health authority within seven days. Patients may be referred to and further information obtained from the Chicago Regional Hansen's Disease Center (808 S. Wood St., Chicago, IL, 60612; phone 312-996-0734) or from the National Hansen's Disease Center (1770 Physicians Park Drive, Baton Rouge, LA, 70816; phone, 800-642-2477).

Figure 1. Hansen Disease (Leprosy) clinical Description and Case Definition. (source CDC MMWR Recommendation and Reports, Case Definition for Infectious Conditions Under Public Health Surveillance. 1997;46 [RR10]:1-55)

Hansen's Disease (Leprosy) clinical description
A chronic bacterial disease characterized by the involvement primarily of skin as well as peripheral nerves and the mucosa of the upper airway. Clinical forms of Hansen's disease represent a spectrum reflecting the cellular immune response to *Mycobacterium leprae*. The following characteristics are typical of the major forms of the disease.

- Tuberculoid: one or a few well-demarcated, hypopigmented and anesthetic skin lesions, frequently with active, spreading edges and a clearing center; peripheral nerve swelling or thickening also may occur
- Lepromatous: a number of erythematous papules and nodules or an infiltration of the face, hands and feet with lesions in a bilateral and symmetrical distribution that progress to thickening of the skin
- Borderline (dimorphous): skin lesions characteristic of both the tuberculoid and lepromatous forms
- Indeterminate: early lesions, usually hypopigmented macules, without developed tuberculoid or lepromatous features

Laboratory criteria for diagnosis
- Demonstration of acid-fast bacilli in skin or dermal nerve, obtained from the full-thickness skin biopsy of a lepromatous lesion

Case classification confirmed: a clinically compatible case that is laboratory confirmed

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Factoid Polio: is still endemic in six countries in Asia and Africa (Afghanistan, Egypt, India, Niger, Nigeria and Pakistan). However, the Americas, Western Pacific and the European regions have been officially certified as polio-free. The Global Polio Eradication Initiative has involved more than 200 countries, 20 million volunteers and an international investment of $3 billion.

Public Health Laboratories in Illinois, 100 years

by Patricia Kloppenburg, B.A. and Bernard (Tom) Johnson, M.S.

The state's first public health laboratory was established in Springfield in August 1904, largely through the efforts of Dr. James A. Egan, secretary of the State Board of Health. In 1917, the laboratory became part of the newly formed Department of Public Health. The laboratory tested drinking water and performed diagnostic services for diphtheria, typhoid, tuberculosis and malaria. As the volume of testing increased over the next several years, the laboratory relocated many times before taking up permanent quarters in the State House in 1926. During these early years, the state also operated field laboratories around the state to conduct diphtheria testing. Later, these laboratories began testing for sexually transmitted disease and malaria; some tested milk, which was a concern, especially in the Chicago area with its growing population.

State Public Health Laboratory, 1924

As the demand for laboratory testing increased, the decision was made to establish permanent, branch laboratories in the state. The first was established in

Mount Vernon in 1915; the laboratory examined diphtheria cultures for diagnosis at a rate of 50 cents each. Soon, as the need for diphtheria testing grew, branch laboratories started operating at several sites to meet the growing demand. In 1925, branch laboratories were opened in Palestine (Crawford County) and in Carbondale. Originally, the Carbondale laboratory was to be temporary, a response to the Great Tri-State Tornado Outbreak; however, due to the excellent services provided to the citizens of southern Illinois, the southern branch laboratory was made permanent after other relief activities were discontinued. In 1927, a laboratory was established in Chicago at the State Research Hospital to meet the needs of the city's expanding population. In 1933, a new laboratory in Urbana served to supplement the main facilities in Springfield and the branches in Carbondale and Chicago. At the same time, the Department expanded its testing activities by opening a facility at the State Fairgrounds in Springfield to produce biologics as a licensee of the U.S. Public Health Service. These production activities, which included silver nitrate solution, typhoid fever vaccine, diphtheria toxoid and rabies vaccine, were moved to Chicago in 1939 following the acquisition of a building to house the laboratory.

The Illinois Medical Laboratory Association, in 1925, passed a resolution requesting the director of the state Department of Public Health to conduct inspections and issue certificates of approval to laboratories found competent to perform public health-related analyses. The need to improve the quality of work performed in privately operated diagnostic laboratories became an issue in 1938 and led to the Department's establishment of laboratory inspection services that were, at first, voluntary. In 1939, regulations were enacted making premarital and prenatal laboratory tests valid only when performed in Department-approved laboratories. Later, regulations Illinois developed for the certification of clinical laboratories were used to expand those at the federal level.

During the 1940s and 1950s, the Department and its laboratories continued to address the ever-changing health needs of Illinois citizens. Major projects included the fight against tuberculosis, a cancer control program, drinking water fluoridation, and improved sanitation for drinking water and milk. Several additional laboratory branches were opened to meet the increased demands. In 1954, there were six facilities in operation: Carbondale, Chicago, Champaign, East St. Louis, Rock Island and Springfield. The diversity of the Division's work is reflected in its organizational structure in 1962: Biologic Products, Diagnostic Services, Laboratory Evaluation, Sanitary Bacteriology, Toxicology and Viral Disease Research.

50th Anniversary of State Public Health Laboratory Service, 1954

The 1960s saw an explosion of new and improved diagnostic tests, some of which were developed by the Division of Laboratories. These new tests included fluorescent antibody procedures for rabies. New diagnostic tests for fungal disease, German measles and syphilis were introduced as well as testing for phenylketonuria (PKU) in newborns. Laboratory inspections increased in response to the Illinois Clinical Laboratory Act of 1964 and were expanded to blood banks under the Illinois Blood Bank Act. The Division suffered a temporary setback when a fire struck the Springfield laboratory at 134 N. Ninth Street on August 24, 1965. The fire rendered the laboratory inoperable for several months, during which time testing was rerouted to the branch laboratories. In Chicago, construction of a new laboratory building began in 1968 and was completed in 1973; the laboratory continues to operate from this building today.

Budget restrictions in the 1970s caused some setbacks for the Division. Many staff positions were lost, resulting in the termination of some services. Another 57 positions were transferred to the newly created Illinois Environmental Protection Agency. A significant reorganization and streamlining of laboratory services in 1972 resulted in the closure of the Champaign, East Saint Louis and Rock Island laboratories. However, there were positive developments. Testing was expanded to include serology for hepatitis B, sickle cell disease and other hemoglobinopathies. The

state's Lead Poisoning Prevention Act, signed into law in 1972, led to a rapid expansion of blood-lead analysis. In 1974, a training unit focusing on small hospital laboratories was organized.

The 1980s will forever be associated with the Salmonella outbreak and the Tylenol tampering. Contaminated milk from an Illinois production facility caused the largest outbreak of Salmonella infection ever recorded in the United States, affecting more than 18,000 people in five states. The Department and its laboratory and infectious disease staff met a daunting challenge in investigating and controlling this outbreak. In 1988, the Springfield laboratory moved into a new 73,000-square-feet facility designed specifically for laboratory use. The building also contains the laboratories of SIU School of Medicine and the Illinois EPA.

Outbreaks of a newly discovered strain of *E. coli* marked the 1990s. In 1995, the Division tested samples from children who became ill after swimming at Rock Cut Beach Park in Rockford. The children tested positive for *E. coli* 0157:H7. Again, in 1999, using sophisticated genetic testing, the Division was able to positively pinpoint beef served at a Labor Day party in Menard County as the source of an *E. coli* 0157:H7 outbreak that sickened more than 300 persons in three states.

Division of Laboratories Anthrax Response, 2002

Today, in 2004, the Division's three laboratories in Carbondale, Chicago, and Springfield perform more than 220 different tests to identify congenital, bacterial, mycotic, parasitic and viral diseases. Blood lead testing, animal rabies testing, and the chemical and microbiological analyses of water samples, food and dairy products continue to be important responsibilities of the Division. The laboratories have expanded their capacity to monitor for and respond to outbreaks of disease and to natural and man-made emergencies including bioterrorism. Following the anthrax threats on the East Coast in 2001, the Division tested more than 2000 samples for the presence of this bacterium.

From its humble beginnings in 1904, the Division's employees have been dedicated to providing science-based, high quality data that is the foundation of good public health practice.

Article Alert

In an effort to keep you updated on published articles related to infectious diseases, please be aware of the following.

1. Collins J, Schlager S, Brasher E. Contact investigation of a case of active tuberculosis. American Journal of Infection Control 2004 Feb;32(1): 38-43.
2. Kandula NR, Dworkin MS, Carroll MR, Lauderdale DS. Limitations of short-course therapy for tuberculosis prevention in Mexican immigrants. American Journal of Preventive Medicine 2004 Feb;26(2):163-6.
3. Dworkin MS, Patel A, Fennell M, Vollmer M, Bailey S, Bloom J, Mudahar K, Lucht R. An outbreak of ammonia poisoning from chicken tenders served in a school lunch. Journal of Food Protection 2004 67(6): 1299-1302.

Upcoming Events

13th Annual HIV & STD Conference
November 14-16, 2004
Springfield, Illinois, Renissance Hotel
Contact the IDPH HIV/AIDS Section:
hivconf@idph.state.il.us or 217-524-5983

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