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Epidemiologic Notes and Reports

Human T-Cell Leukemia Virus Infection in Patients with Acquired Immune Deficiency Syndrome: Preliminary Observations

Recent evidence suggests that human T-cell leukemia virus (HTLV) infection occurs in patients with acquired immune deficiency syndrome (AIDS). HTLV has been isolated from peripheral blood T-lymphocytes from several patients with AIDS (*1, 2*), and a retrovirus, related to but clearly distinct from HTLV, has been isolated from cells from a lymph node of a patient with lymphadenopathy syndrome (LAS) (*3*), a syndrome that may precede AIDS itself. Also, HTLV nucleic acid sequences have been detected by nucleic acid hybridization in lymphocytes from two (6%) of 33 AIDS patients (*4*). In addition, antibodies to antigens expressed on the cell surface of HTLV-infected lymphocytes have been detected by an indirect immunofluorescent technique in sera from 19 (25%) of 75 AIDS patients (*5*), including patients with Kaposi's sarcoma alone (10/34), *Pneumocystis carinii* pneumonia alone (7/30), or patients with both diseases (2/11). Similar antibodies were detected in six (26%) of 23 patients with LAS. Such antibodies were rarely found in sera collected from homosexual men in New York City who served as controls during a case-control study in the fall of 1981 (1/81), homosexual men from whom sera were collected in 1978 during visits to a Chicago venereal disease clinic (0/118), and blood donors from a mid-Atlantic state who gave blood in 1977 but were unselected for sexual preference (1/137).

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Editorial Note: HTLV agents are retroviruses that have recently been associated with certain types of adult T-cell lymphoreticular neoplasms of man (*6*). HTLV-1 has been associated with acute T-cell leukemia and a related, but clearly different, viral agent, HTLV-2, with "hairy-cell" T-cell leukemia.

Retroviruses are ribonucleic acid (RNA) viruses containing the enzyme, reverse transcriptase, which allows production of a deoxyribonucleic acid (DNA) copy of their RNA genome. The DNA copy can then be integrated into the genome of the cell. Infections with retroviruses other than HTLV have been associated with a variety of neoplastic diseases in animals including chickens, cats, cattle and gibbons. The feline retrovirus also causes immune suppression.

HTLV agents are the only presently known retroviruses associated with human diseases. Clinically, however, the diseases previously associated with HTLV in endemic areas do not resemble AIDS. Infections are thought rarely to result in malignancies. HTLV may spread from some infected persons to their very close contacts, and concern has been expressed that it

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may be transmissible by blood or blood derivatives (*7*). HTLV infects and immortalizes* T-helper lymphocytes, and the virus can be isolated from infected patients by co-cultivation of their lymphocytes with uninfected human T-lymphocytes.

In the above studies, the reported low frequency of detecting HTLV sequences may reflect depletion of infected T-helper lymphocytes, since patients initially positive for such sequences have had negative tests several months later (*4*).

HTLV-infected cells express specific virus structural and virus-induced cellular proteins. Antibodies reactive with these virus-specific proteins are moderately prevalent (12% of blood donors) in residents of southwest Japan, an area with a relatively high prevalence of adult T-cell leukemia, and in residents of some Caribbean Islands (4% of St. Vincent blood donors); they have rarely been found in healthy Americans or western Europeans, although these population groups have not been studied extensively.

While the above serologic findings associate AIDS with antibody to HTLV-specific cell surface-associated antigens, such antibodies were identified in only about one quarter of the AIDS patients tested. This relatively low frequency of antibody in AIDS patients might represent a lack of test sensitivity, too stringent criteria for positive tests, infection of AIDS patients with an agent related to but not identical with HTLV, nonspecific polyclonal B-cell responses, inability of many AIDS patients to mount antibody responses to these antigens, collection of sera from patients at improper times during disease evolution, or combinations of these and other yet-to-be identified factors. Alternatively, HTLV or an HTLV-like agent might simply represent yet another opportunistic agent in these multiply infected AIDS patients.

Further study is required to determine if any etiologic relationship exists between HTLV and AIDS.

References

1. Gallo RC, Savin PS, Gelmann EP, et al. Isolation of human T-cell leukemia virus in acquired immune-deficiency syndrone. Science, (in press).
2. Gallo RC. Unpublished data.
3. Barre-Senoussi F, Chermann JC, Rey F, et al. Isolation of a T-lymphotropic retrovirus from a patient at risk of acquired immunodeficiency syndrome. Science, (in press).
4. Gelmann EP, Popovic M, Blayney D, et al. Proviral DNA of a retrovirus human T-cell leukemia virus, in two patients with AIDS. Science, (in press).
5. Essex M, McLane MF, Lee TH, et al. Antibodies to human T-cell leukemia virus-associated cell membrane antigens (HTLV-MA) in patients with acquired immune deficiency (AIDS). Science, (in press).
6. Reitz MS Jr, Kalyanaraman VS, Robert-Guroff M, et al. Human T-cell leukemia/lymphoma virus: the retrovirus of adult T-cell leukemia/lymphoma. J Infect Dis 1983;147:399-405.
7. Weiss D, Blattner W, Hahn B, Greaves M. Worries about infectious cancer. Nature 1983;302:567.

*The term, "immortalize," refers to the capacity of HTLV to alter a normal human cell so that the cell will reproduce indefinitely in appropriate media.

International Notes

Tuberculosis and Leprosy Control in Developing Countries

Recent information indicates that the epidemiologic behavior of tuberculosis in some tropical areas may be substantially different from its well-known pattern in developed countries. Wide gaps in knowledge necessitate a revision of present research priorities. The epidemiolo-

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gy of leprosy is even less well understood, primarily because no appropriate method exists to measure the prevalence and risk of infection.

In November 1982, a consulting group of epidemiologists met in Geneva to identify the most important and immediate problems in tuberculosis and leprosy control and to indicate areas for research. The group reviewed present knowledge of the epidemiology of tuberculosis and leprosy in developing countries and selected problems that are most relevant to control policies and can be explored with limited resources.

At present, several centers in developing countries appear to have useful epidemiologic information on tuberculosis and leprosy available and easily retrievable. All such data bases, especially those involving longitudinal follow-up of large populations (e.g., in Chingleput district in South India, described below) should be used for epidemiologic studies of tuberculosis and leprosy, particularly for testing hypotheses that might explain epidemiologic differences between areas.

CHINGLEPUT TRIAL

To verify and possibly quantify previous contradictory results* on the protective effect of BCG vaccination, a new trial (organized by the Indian Council for Medical Research in cooperation with the World Health Organization [WHO] and the United States Public Health Service) was started in 1968 in Chingleput District near Madras, South India. Sensitization with environmental mycobacteria was highly prevalent in this area.

Two vaccines, prepared in accordance with the best available knowledge, and a placebo were randomly administered to over 270,000 persons of all ages. After 7½ years of follow-up, the number of pulmonary tuberculosis cases in the different groups was approximately the same, indicating that BCG vaccination had given no protection against this form of disease.

To assess the protective effect of BCG vaccination against leprosy, a baseline survey was carried out approximately 5 years after the vaccinations, with follow-up every 2½ years. Results of the two follow-up rounds completed so far will be published in the near future.

TUBERCULOSIS

Prevalence of bacteriologically confirmed tuberculosis: Patients who excrete tubercle bacilli (seen on direct smear examination) are primarily responsible for transmitting the infection and disease in a community. Thus, a prevalence survey in a developing country can provide reliable information on the magnitude of the infectious sources pool in the community and form the basis for planning an appropriate control strategy. In the last 20 years, a number of countries in the Southeast Asian and Western Pacific regions have conducted periodic prevalence surveys. The collected data should be analyzed to determine the value of such surveys, not only in epidemiologic terms but also for planning and evaluating the control programs.

Assessment of the annual risk of tuberculosis infection: The tuberculin test has proven a powerful epidemiologic tool for measuring transmission of tuberculosis infection. It is of particular value for assessing change (or the absence of change) in the infection level in an area and provides the best single epidemiologic index of the trend of the tuberculosis problem in a developing country. It is relatively inexpensive, but the interpretation of test results is often complicated by sensitivity induced by mycobacteria other than *M. tuberculosis*, including sen-

*These were explained by variations in the quality of vaccine strains used and by the prevalence in some trial areas of sensitization with environmental mycobacteria that may have served as a "natural" vaccination to which BCG vaccination added little.

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sitivity caused by BCG vaccination in some members of the population. Special survey and analysis methods will be needed to overcome these problems, and these require further investigation.

Further studies of the epidemiologic pattern of tuberculosis: The results now emerging from the Chingleput trial will contribute greatly to understanding the epidemiology of tuberculosis. Various hypotheses have been proposed for further examination in relation to these data, including:

1. The pathogenesis of tuberculosis following infection with the South Indian variant of *M. tuberculosis* may be radically different from that following virulent infection with the normal strain, i.e., a low risk of progressive primary tuberculosis development and a high risk of endogenous reactivation.

2. Sensitivity from other mycobacterial infections in the adult population may provide good protection against tuberculosis in early adult life, but host immunity may wane with increasing age, leaving older adults susceptible to both endogenous and exogenous disease.

3. A substantial proportion of tuberculosis cases among adults is nevertheless likely to result from exogenous reinfection, because risk of infection is high.

Despite intervention by BCG and treatment, the (presumably) stable epidemiologic pattern of the disease in this community is probably little disturbed. A study of the infection risks, the incidence and prevalence of tuberculosis, and the outcome of disease in terms of continued infectivity and death, at different ages in both sexes, should help in understanding the pathogenesis of tuberculosis in the area.

Data from other developing areas should be examined similarly to decide whether the Chingleput experience is unique or can be regarded as typical of tuberculosis in a developing country. Virulence of the organisms isolated in the Chingleput trial should be determined experimentally and, if possible, in vitro to enable the pathogenesis of tuberculosis in the area to be studied further. In addition, current assessment could be made of the risk of tuberculous infection among unvaccinated children in the area population.

Comparisons of the outcome of different case-finding and treatment policies for bacillary cases and assessment of their epidemiologic impact: The poor outcome of treatment among bacillary cases detected in the Chingleput trial illustrates a number of problems. Smear-positive cases are the principal sources of infection in the community, and their rapid and lasting cure by effective and inexpensive forms of short-course chemotherapy will contribute not only to a better outcome for those patients, but also to some reduction in the risk of infection, by cutting short the duration of smear-positivity.

Thus, studies are needed of 1) better approaches to the treatment of bacillary cases of tuberculosis in developing countries and 2) approaches to the more comprehensive detection of smear-positive and, where possible, culture-positive tuberculosis. (The outcome of treatment should be monitored, in terms of both bacillary excretion and survival, and prognostic factors should be studied. In parallel, the risk of tuberculosis infections should be assessed, to detect whether improvements in case-finding and treatment policies are having the desired epidemiologic impact.)

The epidemiologic impact of treating smear-positive cases, relative to that of treating culture-positive cases, is of some importance in tuberculosis control in developing countries. Treatment of smear-positive cases will shorten the duration of their positivity, whereas treatment of culture-positive cases will prevent a proportion of them from becoming smear-positive and perhaps remaining positive for a considerable period. Analyses of the Chingleput trial data and a tuberculosis survey in Bangalore may help resolve this question, or special studies may be needed.

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Surveillance of primary drug resistance: Where possible, arrangements should be made to periodically survey primary drug resistance in developing countries (i.e., drug resistance in newly diagnosed and previously untreated patients). Sputum specimens should be examined in regional reference laboratories. A continued low level of primary drug resistance would be a good indication that satisfactory policies were being maintained.

Use of BCG in the prevention of tuberculosis: The most recent results from the Chingleput trial show some BCG protection from 5 to 10 years after vaccination among children initially aged 0-14 years. The lack of protection during the first 5 years remains unexplained.

It will be important to follow the trial subjects further to see whether protection continues from 10 to 15 years after vaccination. Further studies on the efficacy of BCG in very young children in developing countries will be valuable to establish whether BCG should continue to be recommended as a complement to case-finding and treatment policies for tuberculosis control. A controlled trial of BCG vaccine among young family contacts of smear-positive index cases may no longer be ethical or practicable. However, it should be possible as a measure of vaccine efficacy to monitor the incidence of tuberculous meningitis among young subjects who have been vaccinated . An alternative method of confirming the efficacy of BCG in the newborn would be a case-control study of the frequency of vaccine scars in child cases and in control subjects without disease.

LEPROSY

In general, studies with greater relevance for leprosy control should receive priority. The studies could be broadly grouped into 1) research undertaken with available knowledge and methods and 2) research requiring new tools.

The following studies are recommended under 1) above.

1. Prevalence studies, including sample surveys, to measure the problem and its various dimensions, including distribution by age, sex, contact status, type of disease, etc. Standardized criteria are needed for disease diagnosis, classification, and activity. The uneven distribution of leprosy warrants appropriate designs for sample surveys.
2. Incidence studies in selected areas to identify, where possible, risk factors, vulnerable groups, and the disease trend through changes in its distribution by form, contact status, age, sex, etc. Such studies would be valuable for future vaccine trials.
3. Pathogenesis of leprosy in different regions, particularly the evolution of multibacillary and other progressive forms, and factors contributing to the downgrading of other forms of leprosy to multibacillary leprosy.
4. Studies on the impact of multidrug therapy, through prevalence and incidence studies over a period of time, particularly in younger age groups. The incidence of infection should be studied when tools for identifying subclinical infection become available.
5. Studies on transmission, particularly in relation to attack rates among contacts under different conditions and factors that influence transmission among contacts.
6. Studies on the interaction between leprosy and environmental mycobacteria.
7. Epidemiologic studies on drug resistance, particularly in relation to the infectivity of drug-resistant cases.
8. Re-analysis of all available data from the BCG trials, including the small-scale studies on selected groups such as contacts, to see whether a common pattern of protection against leprosy exists. Case-control studies may help to assess the value of BCG in other areas.

It is likely that reliable immunologic tools may become available in the near future, both

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending May 7, 1983 and May 8, 1982 (18th week)

Reporting Area	Measles (Rubeola)					Menin-gococcal Infections	Mumps			Pertussis			Rubella		
	Indigenous		Imported*		Total										
	1983	Cum. 1983	1983	Cum. 1983	Cum. 1982	Cum. 1983	1983	Cum. 1983	Cum. 1982	1983	Cum. 1983	Cum. 1982	1983	Cum. 1983	Cum. 1982
UNITED STATES	29	591	2	103	486	1,172	111	1,507	2,678	36	574	380	21	409	1,076
NEW ENGLAND	-	2	-	2	8	60	1	64	126	-	18	23	-	6	9
Maine	-	-	-	-	-	6	1	12	27	-	-	-	-	-	-
N.H.	-	-	-	-	1	2	-	13	13	-	2	4	-	2	8
Vt.	-	-	-	-	2	3	-	7	4	-	2	-	-	2	-
Mass.	-	2	-	-	2	20	-	15	62	-	12	9	-	2	-
R.I.	-	-	-	-	-	3	-	7	10	-	2	8	-	-	1
Conn.	-	-	-	2	3	26	-	10	10	-	-	2	-	-	-
MID ATLANTIC	1	8	1	14	31	170	5	110	178	20	178	64	1	24	63
Upstate N.Y.	-	-	-	2	15	63	2	47	38	4	48	41	-	15	31
N.Y. City	1	8	1†	8	14	25	-	7	31	-	15	13	-	2	20
N.J.	-	-	-	1	-	25	2	18	30	-	10	4	-	2	12
Pa.	-	-	-	3	2	57	1	38	79	16	105	6	1	5	-
E.N. CENTRAL	22	350	-	39	31	190	71	742	1,585	2	128	125	-	58	104
Ohio	17	17	-	1	-	74	-	372	1,169	-	44	22	-	1	-
Ind.	-	257	-	-	1	23	-	17	25	-	9	11	-	12	18
Ill.	5	76	-	33	15	35	7	75	106	2	63	62	-	23	28
Mich.	-	-	-	5	15	42	62	236	214	-	6	7	-	11	38
Wis.	-	-	-	-	-	16	2	42	71	-	6	23	-	11	20
W.N. CENTRAL	-	-	-	-	2	72	7	111	187	5	41	17	5	28	23
Minn.	-	-	-	-	-	12	1	17	111	3	17	6	2	5	2
Iowa	-	-	-	-	-	8	2	33	23	-	4	1	-	-	-
Mo.	-	-	-	-	2	36	-	15	7	-	5	5	-	-	15
N. Dak.	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-
S. Dak.	-	-	-	-	-	2	-	-	1	-	2	2	-	-	1
Nebr.	-	-	-	-	-	1	2	2	-	-	-	1	-	-	-
Kans.	-	-	-	-	-	12	2	44	45	2	12	2	3	23	5
S. ATLANTIC	5	130	-	16	29	264	5	93	162	2	70	38	5	48	32
Del.	-	-	-	-	-	-	-	5	3	-	-	3	-	-	1
Md.	-	-	-	2	2	26	1	15	13	-	8	-	-	1	14
D.C.	-	-	-	-	1	4	-	-	-	-	-	1	-	-	-
Va.	-	1	-	11	14	36	1	20	23	-	25	5	-	1	8
W. Va.	-	-	-	-	1	2	1	16	71	-	2	3	-	-	1
N.C.	-	-	-	-	-	51	-	4	6	1	5	6	-	6	-
S.C.	-	-	-	3	-	34	1	5	9	-	5	4	-	-	1
Ga.	-	6	-	-	-	46	1	28	7	-	18	9	-	6	2
Fla.	5	123	-	-	11	65	-	-	30	1	7	7	5	34	5
E.S. CENTRAL	-	-	-	1	5	72	1	26	25	-	5	8	-	5	34
Ky.	-	-	-	1	1	15	1	11	9	-	2	1	-	5	19
Tenn.	-	-	-	-	4	26	-	12	9	-	2	4	-	-	-
Ala.	-	-	-	-	-	21	-	-	4	-	-	-	-	-	-
Miss.	-	-	-	-	-	10	-	3	3	-	1	3	-	-	15
W.S. CENTRAL	-	33	-	12	6	140	4	111	102	3	52	20	2	68	50
Ark.	-	-	-	11	-	9	-	2	5	-	2	-	-	-	-
La.	-	-	-	-	-	27	-	-	3	-	2	-	-	9	-
Okla.	-	-	-	-	-	17	-	-	-	3	22	2	-	-	2
Tex.	-	33	-	1	6	87	4	109	94	-	26	18	2	59	48
MOUNTAIN	-	-	-	2	-	43	3	71	43	4	64	23	1	14	33
Mont.	-	-	-	-	-	1	-	2	3	-	1	-	-	3	3
Idaho	-	-	-	-	-	4	-	4	2	-	2	1	1	4	-
Wyo.	-	-	-	-	-	1	-	-	2	-	4	1	-	1	5
Colo.	-	-	-	2	-	21	-	9	10	3	40	7	-	-	3
N. Mex.	-	-	-	-	-	5	-	-	-	-	5	3	-	-	3
Ariz.	-	-	-	-	-	8	3	48	14	1	9	10	-	4	7
Utah	-	-	-	-	-	3	-	6	10	-	3	1	-	1	10
Nev.	-	-	-	-	-	-	-	2	2	-	-	-	-	1	2
PACIFIC	1	68	1	17	374	161	14	179	270	-	18	62	7	158	728
Wash.	-	1	-	1	16	24	1	26	43	-	1	11	-	6	19
Oreg.	-	5	-	-	-	25	-	-	-	-	3	7	-	9	3
Calif.	1	61	1†	16	356	109	13	133	219	-	14	44	7	143	699
Alaska	-	-	-	-	-	-	-	9	6	-	-	-	-	-	1
Hawaii	-	1	-	-	2	3	-	11	2	-	-	-	-	-	6
Guam	U	-	U	-	4	1	U	-	1	U	-	-	U	-	1
P.R.	-	56	-	-	58	7	2	70	26	-	3	11	-	2	4
V.I.	U	-	U	5	-	-	U	-	-	U	-	-	U	1	-
Pac. Trust Terr.	U	-	U	-	-	-	U	-	1	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations. U. Unavailable †International §Out-of-state

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending May 7, 1983 and May 8, 1982 (18th week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1983	Cum. 1982	1983	1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1983
UNITED STATES	11,157	11,546	1	439	7,632	61	127	61	2,241
NEW ENGLAND	275	217	-	13	195	-	5	1	2
Maine	12	1	-	-	13	-	-	-	2
N.H.	7	1	-	-	16	-	-	-	-
Vt.	2	-	-	-	2	-	-	-	-
Mass.	177	151	-	10	99	-	5	1	-
R.I.	6	12	-	-	16	-	-	-	-
Conn.	71	52	-	3	49	-	-	-	-
MID ATLANTIC	1,371	1,562	-	61	1,391	-	27	-	61
Upstate N.Y.	68	171	-	10	221	-	4	-	29
N.Y. City	825	944	-	34	567	-	13	-	-
N.J.	282	182	-	14	308	-	9	-	-
Pa.	196	265	-	3	295	-	1	-	32
E.N. CENTRAL	442	740	-	48	1,025	-	17	3	175
Ohio	167	110	-	8	157	-	4	1	23
Ind.	60	79	-	-	91	-	1	-	11
Ill.	95	393	-	19	457	-	6	-	94
Mich.	91	121	-	18	271	-	6	2	-
Wis.	29	37	-	3	49	-	-	-	47
W.N. CENTRAL	129	219	-	6	256	20	6	4	330
Minn.	52	37	-	1	45	-	-	-	72
Iowa	4	11	-	-	27	-	-	-	85
Mo.	49	133	-	4	139	15	1	3	38
N. Dak.	1	4	-	-	-	-	-	1	22
S. Dak.	2	-	-	-	19	-	-	-	58
Nebr.	7	8	-	-	7	2	-	-	26
Kans.	14	26	-	1	19	3	5	-	29
S. ATLANTIC	2,904	3,113	-	95	1,482	12	18	17	794
Del.	15	7	-	-	10	-	-	-	-
Md.	176	180	-	13	114	5	5	1	338
D.C.	121	201	-	3	63	-	-	-	1
Va.	205	217	-	8	135	1	4	5	293
W. Va.	10	8	-	5	58	-	2	1	60
N.C.	263	225	-	14	183	5	1	4	4
S.C.	191	147	-	11	137	-	1	4	7
Ga.	538	662	-	17	315	1	-	1	77
Fla.	1,385	1,466	-	24	467	-	5	1	14
E.S. CENTRAL	782	827	-	62	728	7	2	4	187
Ky.	44	40	-	13	196	-	-	1	40
Tenn.	215	224	-	14	214	5	1	1	124
Ala.	327	292	-	10	178	-	-	2	23
Miss.	196	271	-	25	140	2	1	-	-
W.S. CENTRAL	3,019	2,879	1	37	866	18	7	29	484
Ark.	80	79	-	1	75	11	-	3	92
La.	643	625	-	4	137	2	-	-	13
Okla.	91	63	1	6	103	5	-	15	49
Tex.	2,205	2,112	-	26	551	-	7	11	330
MOUNTAIN	266	289	-	16	208	1	7	2	79
Mont.	4	1	-	4	22	-	1	1	61
Idaho	3	16	-	2	13	-	-	1	-
Wyo.	4	9	-	1	4	-	-	-	1
Colo.	65	86	-	-	15	-	1	-	-
N. Mex.	87	60	-	4	41	1	-	-	2
Ariz.	62	64	-	5	86	-	3	-	15
Utah	9	10	-	-	18	-	1	-	-
Nev.	32	43	-	-	9	-	1	-	-
PACIFIC	1,969	1,700	-	101	1,481	3	38	1	129
Wash.	52	53	-	3	77	2	2	-	-
Oreg.	36	48	-	9	68	-	-	-	-
Calif.	1,846	1,551	-	84	1,225	1	35	1	122
Alaska	8	6	-	-	13	-	-	-	7
Hawaii	27	42	-	5	98	-	1	-	-
Guam	-	1	U	U	1	-	-	-	-
P.R.	311	204	-	165	307	-	-	-	20
V.I.	8	-	U	U	1	-	-	-	-
Pac. Trust Terr.	-	-	U	U	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending May 7, 1983 (18th week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	672	473	132	39	14	14	67
Boston, Mass.	198	129	36	21	5	7	32
Bridgeport, Conn.	60	42	15	1	1	1	5
Cambridge, Mass.	37	26	9	1	1	-	5
Fall River, Mass.	27	22	5	-	-	-	-
Hartford, Conn.	46	22	16	3	3	2	1
Lowell, Mass.	16	13	2	1	-	-	-
Lynn, Mass.	25	18	5	2	-	-	-
New Bedford, Mass.	22	19	2	1	-	-	1
New Haven, Conn.	48	38	7	3	-	-	5
Providence, R.I.	60	44	12	1	1	2	5
Somerville, Mass.	7	3	3	1	-	-	1
Springfield, Mass.	42	27	10	2	2	1	9
Waterbury, Conn.	35	28	4	1	1	1	3
Worcester, Mass.	49	42	6	1	-	-	-
MID. ATLANTIC	2,600	1,700	608	164	54	74	96
Albany, N.Y.	65	48	12	2	1	2	1
Allentown, Pa.	13	11	2	-	-	-	-
Buffalo, N.Y.	130	90	29	6	3	2	2
Camden, N.J.	43	25	13	1	2	2	1
Elizabeth, N.J.	37	29	7	-	1	-	1
Erie, Pa.†	39	26	9	2	2	-	-
Jersey City, N.J.	51	34	12	3	-	2	1
N.Y. City, N.Y.	1,357	877	327	100	30	23	40
Newark, N.J.	65	35	15	7	3	5	3
Paterson, N.J.	34	25	6	-	1	2	2
Philadelphia, Pa.†	291	172	67	15	4	33	19
Pittsburgh, Pa.†	70	35	24	7	1	3	3
Reading, Pa.	39	30	5	3	1	-	3
Rochester, N.Y.	125	79	36	9	1	-	7
Schenectady, N.Y.	36	24	7	2	3	-	4
Scranton, Pa.†	34	24	8	2	-	-	1
Syracuse, N.Y.	65	50	13	2	-	-	3
Trenton, N.J.	38	26	10	2	-	-	-
Utica, N.Y.	23	19	2	1	1	-	-
Yonkers, N.Y.	45	41	4	-	-	-	5
E.N. CENTRAL	2,049	1,313	469	129	48	90	82
Akron, Ohio	80	55	20	2	1	2	-
Canton, Ohio	43	32	9	1	1	-	3
Chicago, Ill	425	246	101	41	13	24	9
Cincinnati, Ohio	126	90	26	6	3	1	12
Cleveland, Ohio	172	105	46	12	4	5	5
Columbus, Ohio	90	50	24	8	4	4	3
Dayton, Ohio	109	79	20	6	-	4	7
Detroit, Mich.	211	130	48	17	7	9	4
Evansville, Ind.	36	23	12	1	-	-	2
Fort Wayne, Ind.	46	29	10	6	1	-	-
Gary, Ind.	23	11	8	3	-	1	-
Grand Rapids, Mich.	93	65	19	5	2	2	3
Indianapolis, Ind.	140	89	39	5	-	7	3
Madison, Wis.	38	25	7	3	-	3	2
Milwaukee, Wis.	140	97	30	6	1	6	11
Peoria, Ill.	48	23	5	2	4	14	7
Rockford, Ill.	39	23	10	1	2	3	2
South Bend, Ind.	35	26	5	1	1	2	2
Toledo, Ohio	83	63	15	1	3	1	4
Youngstown, Ohio	72	52	15	2	1	2	3
W.N. CENTRAL	721	495	145	38	20	22	38
Des Moines, Iowa	62	49	10	-	2	1	7
Duluth, Minn.	22	17	5	-	-	-	-
Kansas City, Kans.	33	19	9	4	1	-	1
Kansas City, Mo.	125	81	28	11	3	2	3
Lincoln, Nebr.	42	32	6	2	1	1	6
Minneapolis, Minn.	75	53	13	4	1	4	4
Omaha, Nebr.	98	58	26	4	3	7	8
St. Louis, Mo.	141	97	28	6	7	3	3
St. Paul, Minn.	67	50	10	4	2	1	1
Wichita, Kans.	56	39	10	3	-	3	5
S. ATLANTIC	1,193	733	304	94	25	37	49
Atlanta, Ga.	154	91	40	17	2	4	5
Baltimore, Md.	229	137	60	25	3	4	6
Charlotte, N.C.	59	31	21	5	1	1	1
Jacksonville, Fla.	88	56	22	5	4	1	4
Miami, Fla.	109	73	27	7	-	2	1
Norfolk, Va.	42	23	13	3	2	1	4
Richmond, Va.	73	43	17	6	3	4	7
Savannah, Ga.	46	29	13	3	1	-	5
St. Petersburg, Fla.	106	80	19	1	1	5	3
Tampa, Fla.	72	48	13	6	3	2	5
Washington, D.C.	174	98	49	12	5	10	6
Wilmington, Del.	41	24	10	4	-	3	2
E.S. CENTRAL	725	458	168	38	30	30	38
Birmingham, Ala.	102	67	26	2	2	5	5
Chattanooga, Tenn.	70	47	17	4	1	1	7
Knoxville, Tenn.	54	33	15	2	2	2	1
Louisville, Ky.	123	83	22	10	2	6	14
Memphis, Tenn.	141	85	33	7	10	5	4
Mobile, Ala.	83	50	20	5	6	2	2
Montgomery, Ala.	37	24	8	3	1	1	1
Nashville, Tenn.	115	69	27	5	6	8	4
W.S. CENTRAL	1,104	663	275	88	44	34	47
Austin, Tex.	39	30	5	3	1	-	3
Baton Rouge, La.	45	20	17	2	1	5	2
Corpus Christi, Tex.	46	30	8	1	6	1	-
Dallas, Tex.	178	103	44	15	8	8	3
El Paso, Tex.	49	28	13	4	1	3	4
Fort Worth, Tex.	100	66	24	5	3	2	9
Houston, Tex.	206	108	54	27	13	4	5
Little Rock, Ark.	52	36	12	3	-	1	3
New Orleans, La.	107	67	30	5	4	1	-
San Antonio, Tex.	142	83	41	12	2	4	9
Shreveport, La.	32	20	6	3	1	2	2
Tulsa, Okla.	108	72	21	8	4	3	7
MOUNTAIN	636	391	144	44	31	25	39
Albuquerque, N.Mex.	73	51	10	6	3	3	4
Colo. Springs, Colo.	39	26	7	2	2	2	5
Denver, Colo.	122	71	29	7	8	6	10
Las Vegas, Nev.	70	41	17	6	4	2	2
Ogden, Utah	19	12	4	1	1	1	-
Phoenix, Ariz.	157	94	42	7	8	6	3
Pueblo, Colo.	20	13	4	1	1	1	3
Salt Lake City, Utah	37	21	6	4	3	3	2
Tucson, Ariz.	99	62	25	10	1	1	10
PACIFIC	1,812	1,236	375	108	49	44	107
Berkeley, Calif.	19	11	7	1	-	-	-
Fresno, Calif.	80	51	15	7	4	3	3
Glendale, Calif.	31	22	7	1	1	-	1
Honolulu, Hawaii	60	36	13	6	2	3	7
Long Beach, Calif.	87	61	21	2	2	1	5
Los Angeles, Calif.	569	382	116	44	17	10	26
Oakland, Calif.	44	34	6	2	1	1	2
Pasadena, Calif.	33	21	6	2	-	4	3
Portland, Oreg.	124	85	25	5	2	7	7
Sacramento, Calif.	62	37	20	4	1	-	3
San Diego, Calif.	140	99	27	5	4	5	12
San Francisco, Calif.	157	104	34	12	3	4	7
San Jose, Calif.	147	103	29	8	5	2	14
Seattle, Wash.	146	102	28	8	6	2	4
Spokane, Wash.	51	44	5	1	-	1	6
Tacoma, Wash.	62	44	16	-	1	1	7
TOTAL	11,512††	7,462	2,620	742	315	370	563

* Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

** Pneumonia and influenza

† Because of changes in reporting methods in these 4 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

†† Total includes unknown ages.

TABLE V. Years of potential life lost, deaths, and death rates, by cause of death, and estimated number of physician contacts, by principal diagnosis, United States

Cause of morbidity or mortality (Ninth Revision ICD, 1975)	Years of potential life lost before age 65 by persons dying in 1981[1]	Estimated mortality December 1982		Estimated number of physician contacts December 1982[4]
		Number[2]	Annual Rate/100,000[3]	
ALL CAUSES (TOTAL)	9,879,590	176,590	894.3	84,512,000
Accidents and adverse effects (E800-E807, E810-E825, E826-E949)	2,587,140	7,940	40.2	4,238,000
Malignant neoplasms (140-208)	1,821,900	38,170	193.3	1,537,000
Diseases of heart (390-398, 402, 404-429)	1,621,290	67,380	341.2	4,924,000
Suicides, homicides (E950-E978)	1,403,560	4,560	23.1	—
Cerebrovascular diseases (430-438)	275,000	14,100	71.4	724,000
Chronic liver disease and cirrhosis (571)	267,350	2,410	12.2	107,000
Pneumonia and influenza[5] (480-487)	123,420	4,640	23.5	1,101,000
Chronic obstructive pulmonary diseases and allied conditions (490-496)	116,280	5,270	26.7	1,648,000
Diabetes mellitus (250)	105,960	3,160	16.0	2,212,000
Prenatal care[6]				2,195,000
Infant mortality[6]		3,600	11.4 /1,000 live births	

[1]Years of potential life lost for persons between 1 year and 65 years old at the time of death are derived from the number of deaths in each age category as reported by the National Center for Health Statistics, *Monthly Vital Statistics Report* (MVSR), Vol. 30, No. 13, December 20, 1982, multiplied by the difference between 65 years and the age at the midpoint of each category. As a measure of mortality, "Years of potential life lost" underestimates the importance of diseases that contribute to death without being the underlying cause of death.

[2]The number of deaths is estimated by CDC by multiplying the estimated annual mortality rates (MVSR Vol. 32, No. 1, April 18, 1983, pp. 8-9) and the provisional U.S. population in that month (MVSR Vol. 31, No. 12, March 14, 1983, p.1) and dividing by the days in the month as a proportion of the days in the year.

[3]Annual mortality rates are estimated by NCHS (MVSR Vol. 32, No. 1, April 18, 1983, pp. 8-9), using the underlying cause of death from a systematic sample of 10% of death certificates received in state vital statistics offices during the month and the provisional population of those states included in the sample for that month.

[4]IMS America *National Disease and Therapeutic Index* (NDTI), Monthly Report, December 1982, Section III. This estimate comprises the number of office, hospital, and nursing home visits and telephone calls prompted by each medical condition based on a stratified random sample of office-based physicians (2,100) who record all private patient contacts for 2 consecutive days each quarter.

[5]Data for "infectious diseases and their sequelae" as a cause of death and physician visits comparable to other multiple-code categories (e.g., "malignant neoplasms") are not presently available.

[6]"Prenatal care" (NDTI) and "Infant mortality" (MVSR Vol. 31, No. 12, March 14, 1983, p.1) are included in the table because "Years of potential life lost" does not reflect deaths of children <1 year.

Epidemiologic Notes and Reports

Nontuberculous Mycobacterial Infections in Hemodialysis Patients — Louisiana, 1982

Between April 16 and October 8, 1982, 27 cases of nontuberculous mycobacterial (NTM) infection were identified among 140 patients with end-stage renal disease undergoing outpatient hemodialysis therapy in two centers of a dialysis corporation in Louisiana. The organisms isolated from 24 of these patients have been identified as *Mycobacterium chelonei* subspecies *abscessus*, while that isolated from one patient has been identified as an *M. chelonei*-like organism. The isolates from the remaining two patients have not yet been speciated. Sixteen patients were male. Age ranged from 29 to 81 years (mean 58 years). All 27 patients were dialyzed for 4 hours a day, 3 times a week; 21 at dialysis center A and 6 at dialysis center B. Attack rates were equal in the two dialysis centers, with an overall attack rate of 19%.

A wide spectrum of illness was seen. Eighteen patients had bacteremia, and four had localized infections—three with soft tissue abscesses and one involving an access graft. Five patients had positive cultures from multiple sites, including blood, skin nodules, bone marrow, and hemodialysis grafts. In general, the clinical syndrome associated with isolated NTM bacteremia was characterized by vague constitutional symptoms and low-grade fever; three patients were asymptomatic. Thirteen patients with multiple underlying medical problems have since died; the extent to which their deaths were due to their infections is unknown.

A case-control study was undertaken to identify possible risk factors for the development of NTM infection in hemodialysis patients. Case and control patients were similar in age, sex, and racial distribution. Preliminary results of the epidemiologic investigation did not identify any one risk factor to account for the outbreak. Type of access graft used and hospital in which the graft was inserted did not differ between cases and controls. Exposure to a given dialysis station or a particular type of dialyzer (artificial kidney) was not associated with an increased risk of infection. However, one factor common to all patients and, therefore, not examined in the case-control study was exposure to processed dialyzers.

Before the investigation, all dialyzers used in both centers were processed routinely in dialysis center A before use. The processing procedure included rinsing with water and disinfecting with 2% aqueous formaldehyde for a minimum of 24 hours. Some, but not all, patients reused their dialyzers one or more times. To standardize procedures in the dialysis center and to prevent the "new dialyzer syndrome," the same procedure was used to process new dialyzers for single use and previously used dialyzers for reuse. Four of 10 patients positive for hepatitis B surface antigen, who did not reuse dialyzers, were found to have NTM infections.

Extensive environmental sampling showed NTM in water samples from multiple sites in both dialysis centers, including water used to rinse dialyzers before the disinfection procedure, to prepare the 2% formaldehyde solution used in the disinfection procedure, and to prepare dialysis fluids. While all the environmental isolates have not been speciated, both *M. chelonei* subspecies *abscessus*, and *M. chelonei*-like organisms, along with other NTM, were present in the water. In addition, NTM (speciation pending) were present in the blood compartment (patient side) of five of 31 dialyzers sampled after the routine disinfection procedure. The formaldehyde concentration in two of three culture-positive dialyzers tested was less than 2%, which is the concentration routinely used for disinfection.

Preliminary laboratory studies indicate that, while the patient isolates of *M. chelonei* subspecies *abscessus* tested to date do not survive exposure to 2% formaldehyde for 24 hours, the single *M. chelonei*-like organism recovered from one patient does survive such exposure.

NTM Infection — Continued

No isolates survived exposure to 4% formaldehyde for 24 hours.

In both centers, dialyzer reuse was discontinued and environmental control procedures, including disinfecting the water-treatment systems, were instituted. No new cases of NTM infection have been identified in 34 patients who began dialysis after these interventions.

Reported by JW Brown III, T Cocke, M Marionneaux, Dept of Medicine, Louisiana State University, Baton Rouge, LM McFarland, H Bradford, C Caraway, Louisiana State Dept of Health and Human Resources; Respiratory and Special Pathogens Epidemiology Br, Respiratory and Special Pathogens Laboratory Br, Div of Bacterial Diseases, Div of Hepatitis and Viral Diseases, Center for Infectious Diseases, CDC.

Editorial Note: *M. chelonei* and *M. chelonei*-like organisms are rapidly growing mycobacteria frequently found in soil and water (*1*). Recently, their role in human illness has been recognized with increasing frequency in many different clinical settings. *M. chelonei* has been reported to cause abscesses, cutaneous and lymphatic infections, pulmonary infections, postoperative wound infections, prosthetic-valve endocarditis, thyroiditis, osteomyelitis, arthritis, and ocular infections, while *M. chelonei*-like organisms have been associated with peritonitis in peritoneal dialysis patients (*2*). Although these infections are usually localized, disseminated disease has been reported among immunocompromised patients and in at least one hemodialysis patient (*3*). Medical treatment of such infections is often difficult, particularly for patients with disseminated disease, because the organisms are usually resistant to most antimicrobials.

The source of NTM infection in this outbreak was probably the water used in processing the dialyzers. The design of the water treatment system in this center may have led to high concentrations of these organisms in the water used to process the dialyzers, and inconsistencies in the subsequent disinfection procedures may have resulted in incomplete eradication of NTM from the dialyzers. Patients may then have become infected when their blood circulated through processed dialyzers containing viable NTM.

While a survey of reference laboratories has not identified any other clusters of NTM infections in hemodialysis patients, there is reason for concern that such infections may occur elsewhere. These organisms are known to grow in potable water and, consequently, may be found in water used in hemodialysis centers. Furthermore, standard plate-count methods for monitoring water quality in dialysis centers may not detect this type of contamination. In addition, previous studies have shown that, in comparison with the gram-negative species frequently found in water, NTM—especially *M. chelonei*-like organisms—can be relatively resistant to germicides (*4*). Further studies to evaluate factors that may affect eradication of these organisms in dialyzers are in progress.

At present, dialysis center staffs should ensure that protocols for disinfection of dialyzers be followed rigorously, with particular attention to concentrations of germicides and contact time used. Physicians and dialysis center staffs should also be alert to the possible existence of NTM infection in hemodialysis patients, particularly because such infections may result in minimal, nonspecific symptoms. All hemodialysis patients with signs or symptoms of infection, especially those with unexplained fever, should have appropiate cultures taken. Because growth of NTM from clinical specimens may not be evident before 14 days, cultures should be held for at least this period before being reported as negative, and all isolates should be examined with stains for acid-fast organisms. NTM infections among dialysis patients should be reported to appropriate health departments to facilitate further evaluation of the epidemiology of such infections and to assist in the development of appropriate control measures.

References

1. Wolinsky E. Nontuberculous mycobacteria and associated diseases. Am Rev Respir Dis 1979;119:107-59.

NTM Infection — Continued

2. Band JD, Ward JI, Fraser DW, et al. Peritonitis due to a *Mycobacterium chelonei*-like organism associated with intermittent chronic peritoneal dialysis. J Infect Dis 1982;145:9-17.
3. Azadian BS, Beck A, Curtis JR, et al. Disseminated infection with *Mycobacterium chelonei* in a haemodialysis patient. Tubercle 1981;62:281-4.
4. Carson LA, Petersen NJ, Favero MS, Aguero SM. Growth characteristics of atypical mycobacteria in water and their comparative resistance to disinfectants. Appl Environ Microbiol 1978;36:839-46.

Current Trends

Third-Trimester Induced Abortion — Georgia, 1979 and 1980

During 1979 and 1980, third-trimester induced abortions* reported to Georgia's Department of Human Resources (DHR) accounted for 123.1 per 100,000 legal abortions (86 of 69,876). Because of concern about this reported number and the indications for late abortions, the DHR undertook a medical record review.

The DHR reviewed medical records and verified pregnancy outcome† for 78 (90.7%) of reported third-trimester induced abortions. Of these 78 reports, three were for women who had true third-trimester induced abortions. Two of these were performed to terminate pregnancies involving anencephalic fetuses at 25 and 34 weeks' gestation. The third woman had an abortion at 26 weeks' gestation, but little information was available from which to determine the reason for the procedure. Of the 78 reported to have obtained third-trimester induced abortions, 58 (74.4%) were fetal deaths in utero, while 15 (19.2%) were first- or second-trimester abortions; one was a duplicative report, and one was not an abortion. Thus, the occurrence of true third-trimester-induced abortion was 4.3 per 100,000 legal abortions (3 of 69,876) instead of the reported 123.1.

Reported by JW Flynt, MD, M Lavoie, AK Schoenbucher, MD, Georgia State Dept of Human Resources; Program Evaluation Br, Div of Reproductive Health, Center for Health Promotion and Education, CDC.

Editorial Note: Abortions performed during the third trimester are regulated by Georgia state law, which requires that a physician file an induced-abortion report with the DHR within 10 days of performing an abortion.

It is not clear why women who had fetal deaths in utero were misclassified as having had induced abortions. However, since almost all these women had had labor induced to expel a dead fetus, many attending physicians may report these events as induced abortions rather than as fetal deaths in utero. Misclassification of first- and second-trimester abortions was almost entirely (14/15) due to transcription, coding, or keypunching errors. Of the 15 misclassified abortion reports, 12 represented women who had abortions at less than 14 weeks' gestation.

Underdetection of true third-trimester induced abortions was minimized by defining the third trimester as the period at 25 or more weeks' gestation, as opposed to the DHR's definition of more than 27 weeks' gestation. In addition to reviewing all reported induced abortions

*A third-trimester induced abortion was defined as an abortion performed at 25 or more weeks' gestation by physician estimate.

†Pregnancy outcome was defined as first-, second-, or third-trimester abortion or fetal death in utero.

Abortion — Continued

at 25 or more weeks' gestation by physician estimate, the DHR attempted to find additional cases by reviewing reports of induced abortions performed 25 or more weeks from the date of the last menstrual period when physicians' estimates were either less than 25 weeks' or unavailable. During 1979 and 1980, the DHR record review found no true third-trimester induced abortions among 143 such reports.

Eight third-trimester abortions with unconfirmed pregnancy outcomes were reported. Classification of these as true third-trimester abortions would increase the rate of such abortions from 4.3 to 15.7 per 100,000 abortions.

True third-trimester induced abortions are rare in Georgia. To decrease overreporting such abortions, the DHR is informing physicians how to report induced pregnancy terminations more accurately. If similar concerns exist in other states, CDC recommends periodic verification of reported data.

Measles — United States, First 13 Weeks, 1983

During the first 13 weeks of 1983, 458 measles cases were reported in the United States. This is a 116% increase from the 212 cases reported during the same period last year. Measles among college students accounted for 52.6% (241) of this year's measles cases. In week 12, ending March 26, 1983, 111 measles cases were reported. This is the first time in 92 weeks that more than 100 cases were reported in any one week. More than 98% of the nation's 3,138 counties reported no measles during the 13 weeks of the first quarter.

A provisional total of 70 cases of imported measles was reported to CDC during the first 13 weeks of 1983, an average of 5.4 importations per week. Beginning calendar year 1983, CDC's notifiable diseases reporting system changed to reflect both imported and indigenous measles cases. Imported cases include out-of-state and international importations, plus cases in the first two generations of spread.

Reported by Div of Immunization, Center for Prevention Svcs, CDC.

Editorial Note: The increase from 1982 to 1983 in measles cases during the first 13 weeks can be attributed primarily to outbreaks at the University of Indiana and the University of Houston. Subtracting 1983 college cases from the total leaves 217 cases, which compares favorably with 212 cases reported for the first 13 weeks of 1982.

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The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday.

The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Such reports and any other matters pertaining to editorial or other textual considerations should be addressed to: ATTN: Editor, *Morbidity and Mortality Weekly Report,* Centers for Disease Control, Atlanta, Georgia 30333.

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