

Legionellosis – Continued

Editorial Note: This is the second report of isolating *L. pneumophila* from potable water in association with community-acquired cases of legionellosis (2). Isolation of *L. pneumophila* from showers was reported earlier in association with nosocomial legionellosis (3,4).

At present the epidemiologic importance of these isolations remains unclear. Aerosols generated from potable water may cause infection in susceptible individuals, but isolates of *L. pneumophila* have been obtained from many environmental sources, including potable water, which have had no known association with cases of legionellosis (2, 5-6). Careful case-control studies of legionellosis in concert with systematic environmental sampling need to be done. CDC and the Environmental Protection Agency are planning collaborative efforts in this area. Laboratories at CDC continue efforts to improve techniques for large-scale environmental sampling for *L. pneumophila*.

References

1. CDC. Legionellosis—Italy. MMWR 1980;29:591-2, 597.
2. Tobin JO, Swann RA, Bartlett CLR. Isolation of *Legionella pneumophila* from water systems: methods and preliminary results. Br Med J 1981;282:515-7.
3. Tobin JO, Beare J, Dunnill MS, et al. Legionnaires' disease in a transplant unit: isolation of the causative agent from shower baths. Lancet 1980;2:118-21.
4. Cordes LG, Wiesenthal AM, Gorman GW, et al. Isolation of *Legionella pneumophila* from hospital shower heads. Ann Intern Med 1981;94:195-7.
5. Fliermans CB, Cherry WB, Orrison LH, Thacker L. Isolation of *Legionella pneumophila* from nonepidemic-related aquatic habitats. Appl Environ Microbiol 1979;37:1239-42.
6. Morris GK, Patton CM, Feeley JC, et al. Isolation of the Legionnaires' disease bacterium from environmental samples. Ann Intern Med 1979;90:664-6.

*Epidemiologic Notes and Reports***Reproductive Abnormalities in Male Chemical Workers – Kentucky**

The National Institute for Occupational Safety and Health (NIOSH) found in a recent investigation at a chemical plant in Kentucky that workers exposed to toluenediamine (TDA) and dinitrotoluene (DNT) in the production of TDA had lowered sperm counts.

This evaluation was requested by workers at a chemical plant in Brandenburg, Kentucky, following the discovery of abnormal sperm morphology (specifically, the presence of elevated numbers of tapering forms) in a worker in the TDA unit. This worker had sought clinical evaluation because of his concern about the relationship between his chemical exposures and his wife's recent miscarriages. To evaluate this clinical finding, NIOSH investigators administered medical questionnaires concerning reproductive history and workplace exposures; conducted physical examinations of workers, concentrating on reproductive and endocrine systems; obtained blood specimens for renal and liver function tests; and examined semen specimens for ejaculate volume, sperm count, and sperm morphology.

Thirty workers participated: 9 (of 15) currently exposed, 12 (of 18) previously exposed, and 9 (of 14) with no history of exposure to TDA/DNT. The currently exposed workers had significantly reduced sperm counts as compared with the never-exposed group. The mean sperm count in the currently exposed workers was 55.9×10^6 , compared with 156.8×10^6 in the never-exposed workers ($p < 0.03$ after square root transfor-

Reproductive Abnormalities — Continued

mation). Currently exposed workers also had a significant reduction in the percentage of large morphological forms ($p < 0.015$).

The environmental evaluation included personal and area air monitoring for DNT and TDA exposures. Operator exposures to TDA and DNT ranged from 0.038 to 0.39 mg/M³, and from 0.006 to 0.023 mg/M³, respectively, with the lower values tending to appear later in the investigation. There is no occupational health exposure standard for TDA; all samples for DNT were below the current Occupational Safety and Health Administration (OSHA) standard of 1.5 mg/M³ (1). However, these measured levels may underestimate past exposures and do not reflect possible additional internal exposures resulting from percutaneous absorption.

Reported by the Hazard Evaluations and Technical Assistance Br, Div of Surveillance, Hazard Evaluations, and Field Studies, NIOSH, CDC.

Editorial Note: Little is known about the potential gonadal or reproductive toxicity of TDA or DNT. DNT exposure has usually been associated with a hazard of anoxia secondary to formation of methemoglobin. TDA, theoretically, can also cause methemoglobinemia, but it has not been reported to do so (2). TDA is hepatotoxic (3) and has been shown to be absorbed by inhalation as well as through the skin (4,5). Chronic animal-exposure studies of TDA and DNT indicate potential carcinogenic effects (6,7).

(Continued on page 205)

TABLE I. Summary — cases of specified notifiable diseases, United States
(Cumulative totals include revised and delayed reports through previous weeks.)

DISEASE	17th WEEK ENDING		MEDIAN 1976-1980	CUMULATIVE, FIRST 17 WEEKS		
	May 2 1981	April 26 1980		May 2 1981	April 26 1980	MEDIAN 1976-1980
Aseptic meningitis	67	59	47	1,043	1,035	609
Brucellosis	5	1	2	41	49	49
Chickenpox	6,841	6,812	6,624	107,380	95,739	100,237
Diphtheria	—	—	1	3	1	27
Encephalitis: Primary (arthropod-borne & unspec.)	5	18	12	225	198	186
Post-infectious	4	3	7	28	57	57
Hepatitis, Viral: Type B	399	336	321	6,207	5,262	4,950
Type A	487	544	566	8,172	9,878	9,612
Type unspecified	192	229	177	3,601	3,578	2,922
Malaria	24	52	14	393	496	138
Measles (rubella)	147	770	1,353	1,062	6,177	11,266
Meningococcal infections: Total	65	49	47	1,546	1,106	943
Civilian	65	49	47	1,543	1,097	934
Military	—	—	—	3	9	6
Mumps	105	191	485	1,787	4,514	7,544
Pertussis	24	20	20	334	326	326
Rubella (German measles)	73	129	452	955	1,699	6,252
Tetanus	1	2	1	14	15	15
Tuberculosis	559	546	662	8,498	8,278	8,902
Tularemia	4	6	2	38	33	33
Typhoid fever	5	13	9	151	96	117
Typhus fever, tick-borne (Rky. Mt. spotted)	20	6	8	47	25	29
Veneral diseases:						
Gonorrhea: Civilian	18,920	18,456	16,696	312,387	306,216	306,216
Military	400	439	439	9,157	8,708	8,746
Syphilis, primary & secondary: Civilian	487	609	435	9,670	8,620	7,893
Military	7	6	6	116	116	100
Rabies in animals	194	190	89	2,233	1,930	917

TABLE II. Notifiable diseases of low frequency, United States

	CUM. 1981		CUM. 1981
Anthrax	—	Poliomyelitis: Total	—
Botulism	17	Paralytic	—
Cholera	—	Pittacosis (Wash. 1)	25
Congenital rubella syndrome	5	Rabies in man	—
Leprosy (Mich. 1, Ark. 1, Tex. 2, Ariz. 1, Wash. 1, Calif. 1)	72	Trichinosis (N.J. 1)	65
Leptospirosis	14	Typhus fever, flea borne (endemic, murine)	4
Plague (Colo. 1)	2		

All delayed reports and corrections will be included in the following week's cumulative totals.

Reproductive Abnormalities – Continued

The findings of this study are suggestive of male reproductive toxicity from exposure to TDA and/or DNT. The population size is small, and a large number of additional individuals must be investigated to corroborate the findings at this plant. At present, NIOSH is planning (1) to further analyze the serum specimens collected in this study for serum testosterone, follicle-stimulating hormone, and luteinizing hormone levels; (2) to identify other plants using TDA to determine if the problems identified in this evaluation exist elsewhere; and (3) to recommend that the National Toxicology Program conduct additional animal studies to assess further the reproductive toxicity of TDA and DNT.

References

1. Occupational Safety and Health Administration. General industry: OSHA safety and health standards (29 CFR 1910) (OSHA 2206 Revised 1978). Washington, D.C.: U.S. Department of Labor, 1979.
2. Patty FA, ed. Industrial hygiene and toxicology. 2nd ed. New York: Interscience Publishers, 1963.
3. Green HH, Schall W. Beitrag zur frage des toluylendiaminakterus. Beitr z Path Anat u z Allg Path 1932;89:61-75.
4. Kiese M, Rachor M, Rauscher E. The absorption of some phenylenediamines through the skin of dogs. Toxicol Appl Pharmacol 1968;12:495-507.
5. Kiese M, Rauscher E. The absorption of p-toluenediamine through human skin in hair dyeing. Toxicol Appl Pharmacol 1968;13:325-31.
6. Kinkel HJ, Holzmann S. Long-term percutaneous toxicity and carcinogenicity of hair dyes (oxidizing dyes) in rats. Food Cosmet Toxicol 1973;11:641-8.
7. Ito N, Hiasa Y, Konishi Y, Marugami M. The development of carcinoma in liver of rats treated with m-toluylenediamine and the synergistic and antagonistic effects with other chemicals. Cancer Res 1969;29:1137-45.

*Current Trends***Urban Rat Control – United States**

During the first quarter of fiscal year 1981, 64 urban rat-control programs identified 1,434 environmentally improved blocks (EIBs). An additional 1,431 blocks achieved the improved, rat-free maintenance status (Table 1). Services were provided to 3.2 million people living on 22,000 target-area blocks. As of December 31, 1980, there were 37,543 cumulative EIBs and 10,110 blocks in maintenance. Over 6.9 million people lived in neighborhoods that were improved and made rat free.

Each urban rat-control program is designed to eliminate, on a long-term basis, the environmental conditions that permit rat infestation. The cornerstone of the operation is a one-on-one resident information and educational service to promote neighborhood sanitation and cleanup. Rat baiting is an essential but secondary component.

As one means of assisting communities to implement rat-control measures, the Urban Rat Control Program sponsors surveys to test rats for resistance to anti-coagulant rodenticides, the safest and most common rodenticides used in communities. Under well-defined procedures, selected communities trap and submit rats for evaluation. Since 1977, surveys of rats have been completed for 52 areas in 41 cities. Twenty-five areas have been identified as having a significant resistance problem. When such a problem is identified, communities are assisted in modifying baiting practices and in accelerating efforts to improve their environment.

Reported by Environmental Health Services Div, Center for Environmental Health, CDC.

M M M M R

MORBIDITY AND MORTALITY WEEKLY REPORT

- Epidemiologic Notes and Reports**
- 197 Multiply Resistant Pneumococcus — Colorado
 - 199 Reproductive Abnormalities in Male Chemical Workers — Kentucky
 - International Notes**
 - 198 Follow-Up on Legionellosis — Italy
 - Current Trends**
 - 205 Urban Rat Control — United States

Epidemiologic Notes and Reports

Multiply Resistant Pneumococcus — Colorado

In November 1980, a multiply resistant strain of *Streptococcus pneumoniae*, serotype 6B, was isolated from the cerebrospinal fluid (CSF) of an 11-month-old infant with meningitis. The isolate was found to be resistant to penicillin G, chloramphenicol, and tetracycline; this is the first instance reported in the United States of a pneumococcus resistant to all 3 drugs.

The minimum inhibitory concentration (MIC) for penicillin G was 1 $\mu\text{g/ml}$; for chloramphenicol, 16 $\mu\text{g/ml}$; and for tetracycline, 16 $\mu\text{g/ml}$. The organism was sensitive to rifampin, and the child, who had responded poorly to penicillin (positive CSF culture and Gram stain 4 days into therapy), recovered after treatment with ampicillin, chloramphenicol, and rifampin.

Since the child had regularly attended a day-care center with approximately 55 other children, a survey was conducted at the day-care center to detect carriage of the resistant isolate. Throat cultures from 4 of 14 children (29%) in the toddler room (under age 2 years) were positive for the multiply resistant pneumococcus (MRP); in the preschool area, 4 of 37 children (11%) and 1 of 10 adult employees (10%) were positive. Throat cultures from 6 of 12 household contacts (50%) of MRP carriers and 0 of 19 household contacts of noncarriers were positive for MRP ($p = .0012$, Fisher exact test). In day-care-center contacts of the index patient, a history of antibiotic use in the previous 2 months was significantly associated with the carriage of MRP (78% vs. 29%, $p = .012$, Fisher exact test). One-hundred twenty-five children and staff members in 6 other day-care centers in the metropolitan area had negative throat cultures for MRP. To date, no other cases of invasive disease with this MRP have been recognized.

Prospective studies of MRP transmission in the day-care center are being performed. Attempts to eradicate carriage of this isolate were ruled out by the investigators because data about the risk of invasive disease associated with these isolates are scarce, and because effective regimens for termination of carriage have not been clearly determined.

Reported by M Radetsky, MD, M Glode, MD, T Johansen, MT, A Wiesenthal, MD, S Parmelee, Denver Children's Hospital, B Lauer, MD, University of Colorado Hospital, RS Hopkins, MD, State Epidemiologist, Bacteriology Laboratory and Communicable Disease Sect, Colorado State Dept of Health, in the Colorado Disease Bulletin 1981; IX (1); and Special Pathogens Br, Bacterial Diseases Div, Center for Infectious Diseases, CDC.

Editorial Note: The first report of penicillin-resistant pneumococci appeared in 1967 (7). Since then, relatively resistant (penicillin MICs of 0.1 to 0.9 $\mu\text{g/ml}$) and resistant (penicillin MIC ≥ 1 $\mu\text{g/ml}$) strains have been reported from many parts of the world. The prevalence of relative resistance reported in clinical isolates has varied from 1% to as high as 16%, but most studies show a prevalence of approximately 2%.