

Under: CDC, Listeriosis Surveillance

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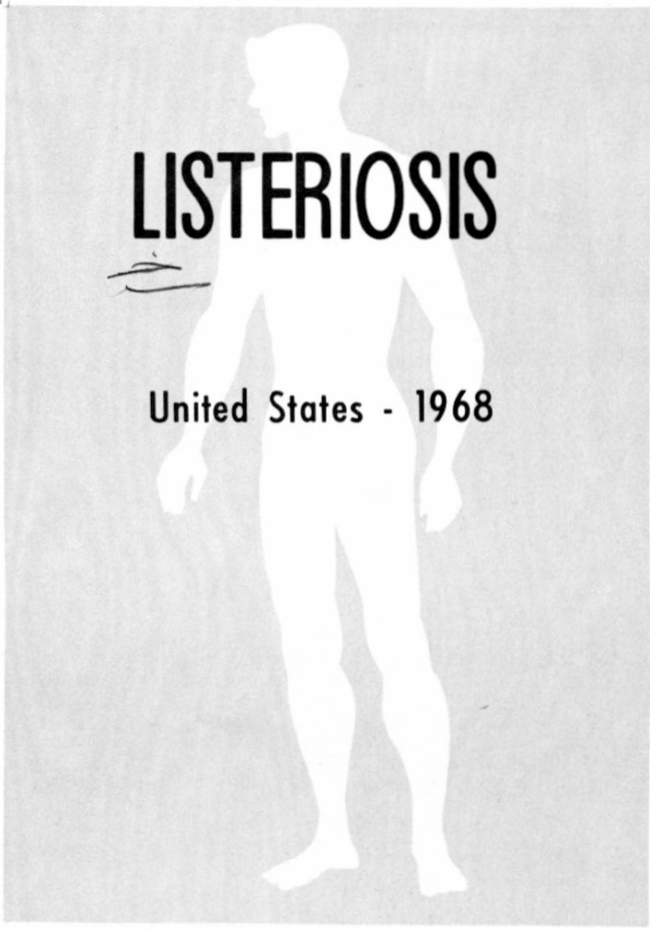
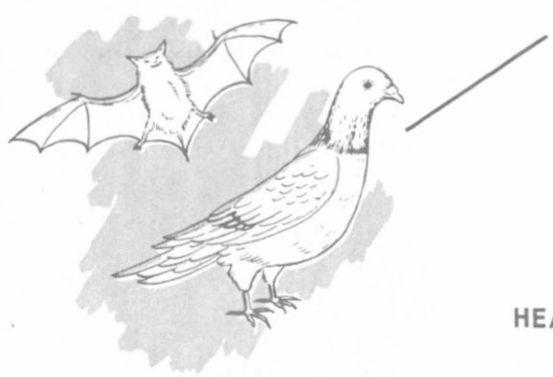
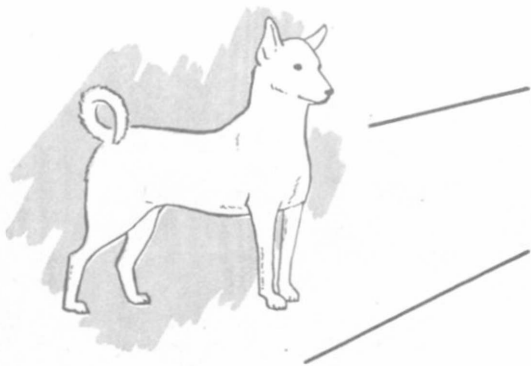
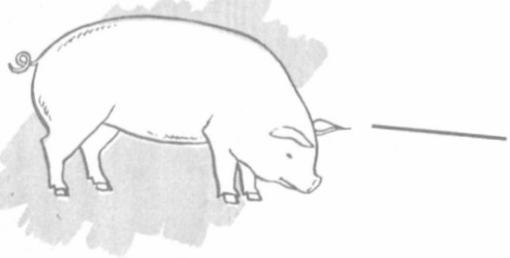
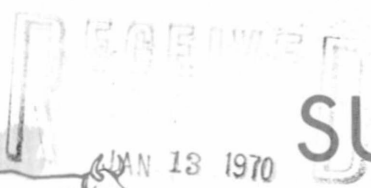
**ANNUAL SUMMARY
LISTERIOSIS, 1968**

DECEMBER 1969

NATIONAL
COMMUNICABLE DISEASE CENTER

ZOONOSES

SURVEILLANCE



LISTERIOSIS

United States - 1968

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE

HEALTH SERVICES AND MENTAL HEALTH ADMINISTRATION

HUMAN LISTERIOSIS IN THE UNITED STATES - 1968

GENERAL

It was not until 1929 that Listeria monocytogenes was reported to cause disease in man,¹ although infections caused by this bacterium have been recognized as a significant problem in animals since 1911.¹⁰ Since its recognition, human listeriosis has been considered a rare disease. Within the past decade, it has been reported with increasing frequency until it appears that listeriosis in man is not rare, but rarely recognized.

One hundred-five cases of human listeriosis were reported to the National Communicable Disease Center in 1968, 45 more cases than were reported in 1967. Listeriosis was a contributing factor in the death of at least 24 of the 105 cases. The increase in the number of reported cases is probably due to an increased awareness of the disease by physicians and laboratory personnel, and not to a rise in the incidence of the disease.^{2, 12}

GEOGRAPHIC DISTRIBUTION (Table I)

Twenty-eight states reported cases in 1968 compared to 24 states in 1967. California, Massachusetts, Michigan, Illinois and Texas accounted for 45 percent of the cases. The greatest increase in cases was reported from Illinois while California recorded the greatest decrease in cases. Sixteen states reported no cases in either 1967 or 1968, but 10 states which had no cases in 1967 noted cases in 1968, and 6 states reporting cases in 1967 recorded no cases in 1968. Eighteen states noted cases in 1967 and 1968.

AGE AND SEX DISTRIBUTION (Table II)

Fifty-six percent of 66 cases, where age was known, occurred in those age groups over 40. However, as in 1967, the highest percentage of cases in a single age group occurred in the newborn, i.e. those less than 4 weeks old.^{5, 10} Other investigators have also noted this epidemiologic characteristic.

The sex distribution in 1968 cases was almost equally divided; 47 percent were males and 53 percent were females. In contrast, two-thirds of the 1967 cases were males. The greatest difference in the sex distribution occurred in neonates with a male/female ratio of 7/14 in 1968 and 10/3 in 1967.

MORTALITY (Table II)

The listeriosis mortality rate in infants less than 3 weeks of age has been estimated to be 40 percent in full-term infants and 70 percent in premature infants.⁸ The form of the disease referred to as granulomatous infantisepsis has been said to be about 90 percent fatal. One author reported that the overall fatality rate of neonates was 54 percent.¹⁰ In 1968, the neonatal death rate was 24 percent compared to a rate of 77 percent for those over 40 years of age. The overall rate for 1968 was 23 percent although there are reports in the literature of rates up to 50 percent.^{5, 6}

TEMPORAL DISTRIBUTION (Figure 1)

Over 60 percent of 98 cases in which the date of onset or date of culture was known occurred during the summer and early fall months. The smallest number of cases occurred in November.

INFECTING SEROTYPE (Table III)

Again in 1968, as in 1967, serotype 1b was isolated most frequently, accounting for 52 percent of the 67 isolates serotyped. Types 1a and 4b were also commonly isolated.

ISOLATIONS FROM HUMAN CASES (Table IV)

L. monocytogenes was isolated solely from cerebrospinal fluid in 55 percent of 89 cases. Blood alone yielded 35 percent of the isolates while 7 percent were made from both cerebrospinal fluid and blood. Other isolations were made from placenta, brain, lung, vagina, eye, throat, urine, and gastric washings.

The laboratory identification of the organism depends on the alertness of the technician not to dismiss as contaminants short gram-positive rods isolated from blood or cerebrospinal fluid. This microorganism is often confused with motile enterococci, Erysipelothrix, lactobacilli, beta-hemolytic Streptococcus, and Corynebacterium spp. (diphtheroids).¹²

CLINICAL ASPECTS

The clinical picture of listeriosis in the 1968 cases was varied. Many patients were febrile and most had signs of meningeal irritation and septicemia. Meningitis is the most common manifestation of human infection in the United States,⁶ although a number of forms occurring singly or in combination, have been described in the literature. These include the oculoglandular form, the typhoid pneumonia form, septicemia, central nervous system disturbance, abortion, granulomatous infantiseptica, a form associated with neoplasia and lymphoproliferative diseases, subacute bacterial endocarditis, urethritis, conjunctivitis, and cutaneous infection.¹²

TREATMENT

L. monocytogenes is inconsistently sensitive to a wide variety of antibacterial agents,⁵ but a number of researchers report the tetracyclines to be the drugs of choice.^{4, 10, 15} Other investigators have found ampicillin to be effective.¹⁴ Macnair, White, and Graham described the successful use of intrathecal ampicillin in two cases of listeria meningitis.⁹

In 1968 cases, treatment involved a number of different antibiotics used alone or in combination. Ampicillin and penicillin were employed most commonly. About one-third of the patients in which treatment was recorded received corticosteroids.

Listeriosis associated with corticosteroid therapy has been previously demonstrated.^{4,5,7} English and McCafferty reported a case of acute listeria meningitis in which corticosteroid therapy for a primary condition made treatment more difficult, but the authors also noted that the recovery was complete.⁵ In addition, they felt that the anti-inflammatory effects of the steroid may have minimized potential residual effects on the central nervous system, although complete recoveries are not uncommon in listeria meningitis. Johnson and Colley, on the other hand, described a fatal case of listeria encephalitis associated with the administration of a corticosteroid.⁷

Corticosteroids being administered to patients with listeriosis often have been utilized in treating an underlying disease prior to the onset of listeriosis. It has been observed that this disease is not infrequently found as a complication of a primary disorder. Of the 1968 cases, 24 patients (23 percent) were reported to be suffering from a primary disease process at the time of the clinical onset of listeria infection. In eight of these (33 percent), listeriosis was given as the cause of death. The primary diseases included liver cirrhosis, valvular heart disease, arteriosclerosis, Hodgkin's disease, cholangiocystic hepatitis, malignant histiocytoma, carcinoma of the breast, chronic lymphatic leukemia, diabetes mellitus, lymphosarcoma, multiple myelomas, and Loenners' cirrhosis.

EPIDEMIOLOGY

Listeriosis remains a mystery to the epidemiologist. The organism is ubiquitous in nature. Man, animals, and birds are susceptible and may act as reservoirs.

Isolations of L. monocytogenes from healthy chickens have led to the suggestion that poultry may be a prime reservoir.¹¹ Other animal hosts have been implicated as sources for human infections because in some countries human cases are found largely in rural environments. In contrast, however, most recent cases in the United States have been in urban residents who had few or no known animal contacts.⁴

In addition to animal reservoirs, the role of vegetation has been questioned. The relationship between poor-grade silage and the occurrence of listeriosis in cattle is well known. In a recent study, Welshimer sampled dead corn vegetation that had remained in fields over winter.¹³ He cultured for L. monocytogenes using Gray's cold-holding procedure. The study was performed in an area in which animal or human listeriosis was rare, but eight isolations were made from 7 of 12 farms. The serotypes cultured were those types less commonly isolated from man or animals in the United States, and only two of these isolates were pathogenic to mice.

CASE REPORTS

Connecticut

A 50-year-old engineer was admitted to a hospital after five days of illness characterized by fever and headache. After admission his temperature ranged from 102° to 104°F. Other symptoms observed included chills, slowing of speech, forgetfulness, lethargy, nuchal rigidity and nystagmus. A spinal tap disclosed a cerebrospinal fluid pressure of 300 cm. of water, 2,000 leukocytes of which 80 percent were polymorphonuclear cells, 180 mg/100 ml protein, 15 mg/100 ml sugar, and intracellular gram-positive rods. The CSF yielded L. monocytogenes, type 4a. The patient was treated with penicillin intravenously. He recovered and was released. The source of infection could not be determined. The patient had no history of contact with animals or rural environments.

Tennessee

A two-week old boy was presented with a history of high fever and irritability for 24 hours prior to admission to a hospital. The patient had had an unsterile delivery, but seemed to be doing well until the onset of illness. Physical examination revealed a well developed, but irritable infant with questionable nuchal rigidity. The spinal fluid contained about 3800 leukocytes/ml, 195 mg/100 ml protein, and 50 mg/100 ml sugar. The white blood cell count was 15,100 with 63 percent being segmented cells. L. monocytogenes was cultured from the CSF.

The patient was successfully treated with kanamycin and ampicillin. On discharge, after 10 days of hospitalization, a CSF culture was negative. At this time examination of the CSF revealed 119 leukocytes/ml with 79 percent being monocytes.

Kentucky

A 62-year-old tavern owner was hospitalized with an incarcerated epigastric hernia which was reduced. The patient had a history of hypertension and chronic alcoholism. During hospitalization his temperature rose to 101.6°F, and he exhibited severe meningitis with grand mal seizures. The patient died 6 days after the onset of illness and L. monocytogenes, type la, was isolated from cerebrospinal fluid. Treatment included analgesics, tranquilizers, atropine, intravenous fluids with vitamins, an anticonvulsant, an antipyretic, and an intravenous antibiotic.

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TABLE I HUMAN LISTERIOSIS 1967-1968*

State	Comparison of Nos of Cases in 1968 with			State	Comparison of Nos of Cases in 1968 with		
	1967	1968	1967		1967	1968	1967
Alabama	2	1	-1	Montana	0	0	0
Alaska	1	0	-1	Nebraska	0	0	0
Arizona	2	0	-2	Nevada	0	0	0
Arkansas	1	2	+1	New Hampshire	0	0	0
California	11	8	-3	New Jersey	1	3	+2
Colorado	2	2	0	New Mexico	0	0	0
Connecticut	0	2	+2	New York	4	4	0
Delaware	0	0	0	N. Carolina	4	4	0
Florida	0	3	+3	N. Dakota	1	0	-1
Georgia	2	4	+2	Ohio	2	5	+3
Hawaii	0	1	+1	Oklahoma	0	0	0
Idaho	0	0	0	Oregon	1	1	0
Illinois	3	14	+11	Pennsylvania	6	4	-2
Indiana	0	3	+3	Rhode Island	0	0	0
Iowa	0	1	+1	S. Carolina	1	0	-1
Kansas	1	0	-1	S. Dakota	0	0	0
Kentucky	1	2	+1	Tennessee	1	2	+1
Louisiana	4	3	-1	Texas	5	10	+5
Maine	0	1	+1	Utah	0	0	0
Maryland	0	1	+1	Vermont	0	0	0
Massachusetts	1	7	+6	Virginia	0	0	0
Michigan	0	8	+8	Washington	0	2	+2
Minnesota	1	5	+4	W. Virginia	0	0	0
Mississippi	0	0	0	Wisconsin	2	0	-2
Missouri	0	2	+2	Wyoming	0	0	0
				TOTALS	60	105	+45

*Provisional Data

Source: Case reports submitted to NCDC

Table II - AGE AND SEX DISTRIBUTION OF 66 HUMAN
LISTERIOSIS CASES - 1968

Age Group	Sex		Total	Percent of Total	Fatalities	Group Fatality Rate
	Male	Female				
0 - 4 wks	7	14	21	31	5	24
4 wks- 9 yrs	2	2	4	6	--	--
10-19 yrs	--	--	--	--	--	--
20-29 yrs	--	3	3	4.5	--	--
30-39 yrs	1	--	1	1.5	--	--
40-49 yrs	4	4	8	12	4	50
50-59 yrs	8	8	16	24	6	37.5
60-69 yrs	4	3	7	11	3	43
70+ yrs	5	1	6	9	4	67
TOTALS	31	35	66	99	22	33

Source: Case reports submitted to NCDC

TABLE III HUMAN LISTERIOSIS BY INFECTING
SEROTYPE - 1968

Infecting Serotype	Number of Cases
1	4
1a	16
1b	35
4	1
4b	18
4c	1
4d	2
Untyped	26
Not cultured	2
Total	105

Source: Bacteriology Section, Laboratory
Program, NCDC, and case reports
submitted to NCDC

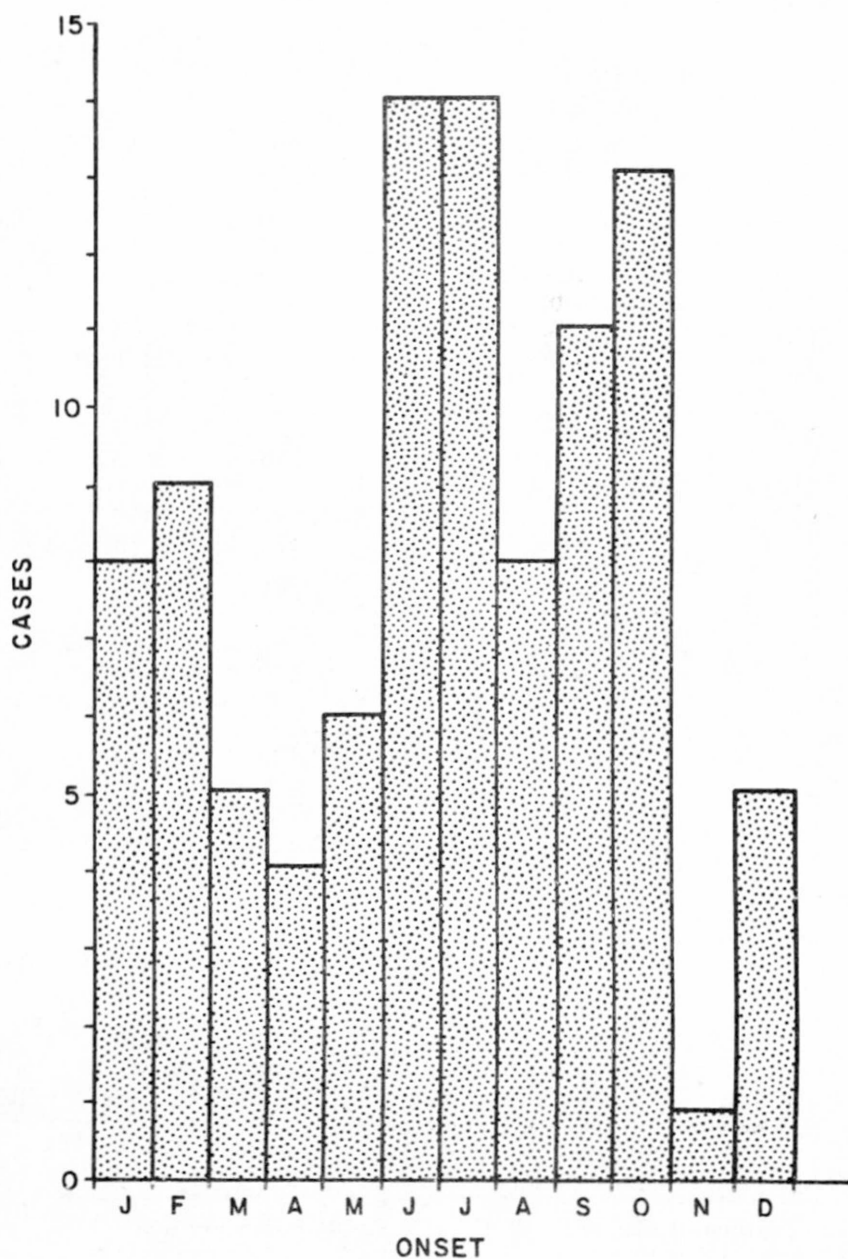
TABLE IV ISOLATIONS FROM HUMAN LISTERIOSIS
1968

Tissue Cultured	Number of Cases
CSF	49
Blood	31
CSF and Blood	6
Unknown	14
Not cultured	2
Other*	3
Total	105

* Cases in which isolations were not made from
CSF and/or blood.

Source: Bacteriology Section, Laboratory
Program, NCDC and case reports
submitted to NCDC

Figure 1 98 CASES OF HUMAN LISTERIOSIS,
BY MONTH OF ONSET,* 1968



* MONTH OF CULTURE IF MONTH OF ONSET UNKNON

STATE EPIDEMIOLOGISTS STATE PUBLIC HEALTH VETERINARIANS

Viral Key to all disease surveillance activities are the State Epidemiologists, who are responsible for collecting, interpreting, and transmitting data and epidemiological information from their individual States. Their contributions to this report are gratefully acknowledged. In addition, valuable contributions to zoonoses surveillance reports are made by State Public Health Veterinarians.

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*Dual assignment