

8-1-1960

Aseptic Meningitis

Maine Department of Health and Welfare

Alta Ashley

Maine Department of Health and Welfare

Follow this and additional works at: https://digitalmaine.com/dhhs_docs

Recommended Citation

Maine Department of Health and Welfare and Ashley, Alta, "Aseptic Meningitis" (1960). *Health & Human Services Documents*. 24.

https://digitalmaine.com/dhhs_docs/24

This Text is brought to you for free and open access by the Health & Human Services at Digital Maine. It has been accepted for inclusion in Health & Human Services Documents by an authorized administrator of Digital Maine. For more information, please contact statedocs@maine.gov.



DEAN H. FISHER, M.D.
COMMISSIONER

Reprinted from the August 1960 issue of
The Journal of the Maine Medical Association

State Of Maine
Department of Health and Welfare

Aseptic Meningitis

ALTA ASHLEY, M.D., M.P.H.*

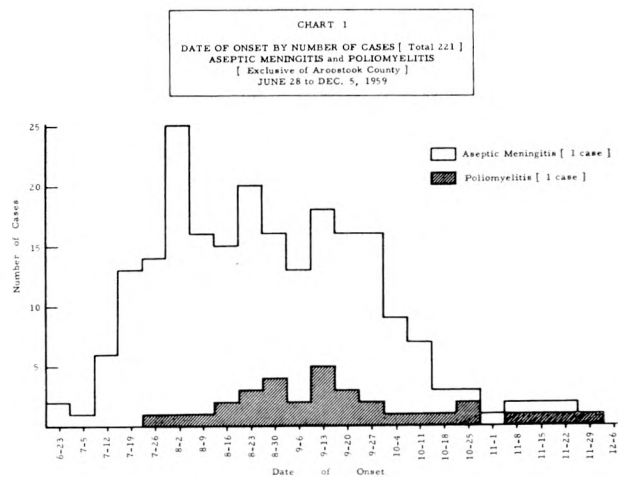
During the fourth week of July in 1959, paired sera were sent to the State Diagnostic Laboratory for "viral studies" on a case of possible aseptic meningitis, an eleven year old boy from Warren (Knox County). A second pair arrived on a case in Litchfield (Kennebec County) and shortly after that a third case was reported from Topsham (Sagadahoc County) which was of particular interest because the patient had received a fourth Salk vaccine inoculation in May 1959 and had had ECHO 9 aseptic meningitis in August of 1958. A fourth case from nearby Wiscasset (Lincoln County) was hospitalized the same night and the local practitioner stated that he had seen many similar cases during the previous week. The striking symptoms common to all were: photophobia or retrobulbar pain, sensitive skin and myalgia, with fever and some nuchal rigidity but no muscular weakness.

During the first half of August cases began to be reported from hospitals over the lower central portion of the State, particularly in the Kennebec Valley area. Physicians were queried as to the number of hospitalized and non-hospitalized cases they were attending. Pediatricians tended to speak of seeing the greatest number. One stated that he had seen six to eight cases a day over a period of several weeks.

Most cases were seen at home or even treated over the telephone. The disease often swept through an entire family in a matter of days; in some families serial cases appeared at about weekly intervals. When it became apparent that a disease with distinctive symptom complex was prevalent, the Public Health Service was contacted to learn whether or not similar outbreaks had occurred elsewhere. In response to this call, an epidemiologic team arrived on August 21 to help in the study of this outbreak, the first reported up to this time.

On August 21, a twenty-seven year old woman who had had two Salk vaccine inoculations in 1956 was admitted to a hospital in Central Maine with illness of thirteen days duration and involvement of all four extremities, particularly the left thigh. Her physician, a

*District III Health Officer.

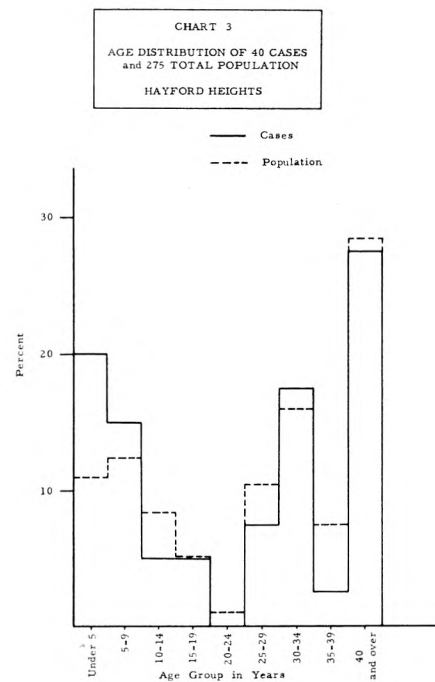
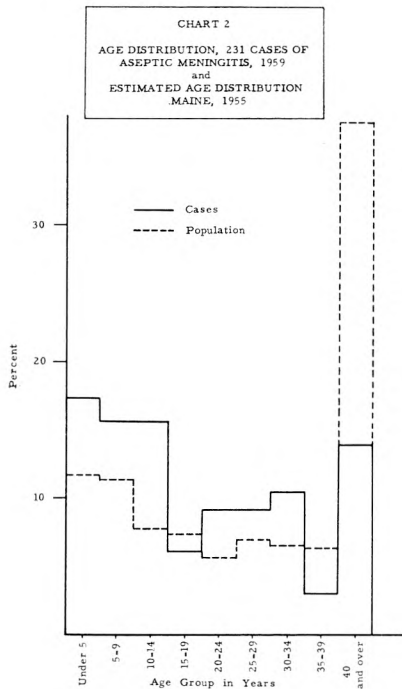


close associate, shortly before had had similar symptoms — chills, sweats, headache, eyepain, difficulty in voiding and defecation, tender skin and general muscular weakness. This case and an unvaccinated child reported from a Portland hospital with weakness of the right leg, were the only cases with frank muscular weakness known up to that time.

As the summer progressed, more cases of paralysis occurred scattered throughout the State, exclusive of Aroostook County, but they were only a small portion of the total cases; most were mild with moderate, if any, paralysis and few deaths occurred. Cases seemed to be most prevalent along the Kennebec River Valley from north at the Forks to Bath at its mouth.

At the time the second paralysis case was reported in District III, a fatal case was reported from Cutler in Washington County. This man worked at the Naval installation during the week and spent week-ends in New Brunswick near Presque Isle. The first case with onset in Aroostook County occurred September 5.

Between July 2 and December 5, a total of 373 cases of aseptic meningitis and paralytic poliomyelitis were made known either through reporting by health officers or through epidemiologic investigation. Of these, 107 occurred in Aroostook County, the rest down-state. This



paper deals only with the down-state cases and chiefly with cases occurring in Health District III. The outbreak in Aroostook County has already been reported in the *Journal of the Maine Medical Association*.^{1,2}

Detailed information was obtained from 65 cases in 62 families, of which 60 in 58 families had onset in Health District III. There were two families on which no information was obtained concerning family size or secondary cases. In the remaining 60 families, there were 297 individuals of whom 139 were ill. Discussion will center around the outbreak revealed by the study of these families and by a community survey in which were found 40 cases in 19 families out of a total of 275 persons in 82 families. This survey was conducted in order to determine how widespread the outbreak was and to see what, if any, relationship polio immunization had to the type and severity of the disease.

Hayford Heights was selected for the community survey because it was easily accessible, the people were expected to be cooperative, cases of aseptic meningitis were known to have occurred in the area and there had been contact with a family in which three cases had occurred. This community is an upper middle-class housing development of 82 families on the road between Augusta and Gardiner. A survey of the area was made by telephone and personal contact early in October in order to obtain some idea of the incidence and character of the disease in the general population. Information was obtained as to age, sex, Salk vaccine inoculations, symptoms, if any, and dates of onset.

Health District III is a central coastal area of five counties lying between Lewiston and Bangor in a triangle bounded on the west by the lower Kennebec val-

ley, on the east by the west shore of the Penobscot River, and on the south by the coast line between these rivers. The northern boundary is roughly parallel to a line running from 10 miles north of Waterville on the Kennebec River to 10 miles south of Bangor on the Penobscot River. Several off-shore islands are included in this area. The total population of this area is approximately 178,000 with a high percentage of older persons. There are no large cities. Waterville and Augusta are the largest, with populations of 18,000 and 22,000 respectively. Four others, Gardiner, Bath, Rockland, and Belfast are over 5,000 while most towns are 2,500 or less. The chief industries are paper, shoe and cotton manufacturing; poultry and egg farming and processing; dairying and fishing. Government and commerce are important in the Augusta area. Waterville is both an industrial and a college community (Colby). Both Augusta and Waterville have large French-Canadian populations. In both Richmond and Pittston there are settlements of "White" Russians. In Knox County, Finns are the predominant "foreign" group. The bulk of the population in the district is English-Irish-Scotch stock ("Yankee").

There are many organized private summer camps, especially in Kennebec County. Tourist traffic is heavy, particularly in Lincoln and Knox Counties. Waldo County is the most rural with only one community, Belfast, being greater than 2,500. There are fewer summer visitors who remain for a significant period of time in this area, in comparison with the remainder of the district.

Roads from southern New England to Quebec, the Maritimes and eastern Maine tourist areas all lead

TABLE A

MAINE
1955 AGE GROUP POPULATION

Age Group	Population	Percent
0 - 4	106,600	11.5
5 - 9	100,400	10.9
10 - 14	70,700	7.6
15 - 19	67,600	7.3
20 - 24	51,700	5.5
25 - 29	63,500	6.9
30 - 34	59,300	6.4
35 - 39	58,900	6.3
40 and Over	348,300	37.6
Total	927,000	100.0

through this district. Thus, during the summer, there is a great deal of traffic passing through this area from other states and from Canada, particularly from other New England states, the Mid-Atlantic and Mid-Western states, Québec and the Maritimes. Visitors from Massachusetts and New York are the most numerous at the time of year referred to in this paper and ease of introducing infections prevalent in those parts is apparent.

Chart 1 gives the week of onset of 221 down-state cases, 188 aseptic meningitis and 33 polio, in which the date of onset was recorded. The first case which developed significant paralysis occurred during the week of July 26. Thereafter, paralytic cases occurred throughout the next four months but five was the maximum number occurring in any one week. Aseptic meningitis, on the other hand, built up to a maximum of 25 the week of August 2 and continued to occur more or less steadily through August and September, but with a gradual decrease through October. Four cases each of aseptic meningitis and polio occurred during November; the last paralytic case had onset the last week of November. The pattern was quite different in Aroostook County where disease did not begin to occur until September 5, was mainly paralytic with nine fatalities and where incidence was fairly constant until November 14.³ The last case had onset December 5, just five days later than the last down-state case.

In Charts 2 and 3 and Table 1 will be found the age distribution in 231 down-state cases including 65 cases from District III and 64 additional cases among their family contacts, 62 miscellaneous down-state cases and 40 cases in Hayford Heights and a comparison with the total State population and that of the community. Although there is a preponderance of cases in children in both groups, there is a surprising number of cases over 40 years of age, particularly in Hayford Heights. This indicates that the agent or agents responsible for these cases were operating in a non-immune population.

The age and Salk vaccine status of the 65 cases on

Table 1

Age - Sex Distribution

231 Cases Aseptic Meningitis & Polio

Age Group	A.M.			Polio			Totals			Percent
	M	F	T	M	F	T	M	F	T	
0 - 4	23	13	36	2	2	4	25	15	40	17.3
5 - 9	20	13	33	2	1	3	22	14	36	15.6
10 - 14	24	9	33	2	1	3	26	10	36	15.6
15 - 19	8	5	13	1	0	1	9	5	14	6.1
20 - 24	5	12	17	3	1	4	8	13	21	9.1
25 - 29	9	10	19	0	2	2	9	12	21	9.1
30 - 34	9	15	24				9	15	24	10.4
35 - 39	4	3	7				4	3	7	3.0
40 and Over	19	12	31	1	1	1	19	13	32	13.8
Total	121	92	213	10	8	18	131	100	231	100.0

Hayford Heights

Age Group	Ill Population			Percent	Well Population			Total Population	Percent
	M	F	T		T	Percent	T		
0 - 4	5	3	8	20.0	22	9.4	30	11.0	
5 - 9	3	3	6	15.0	28	11.9	34	12.3	
10 - 14	2		2	5.0	21	8.9	23	8.3	
15 - 19	2		2	5.0	12	5.1	14	5.1	
20 - 24					3	1.3	3	1.1	
25 - 29		3	3	7.5	25	10.6	28	10.3	
30 - 34	4	3	7	17.5	37	15.7	44	16.0	
35 - 39	1	2	3	7.5	20	8.5	21	7.6	
40 and Over	3	6	9	22.5	67	28.6	78	28.3	
Total	20	20	40	100.0	235	100.0	275	100.0	

Table 2

Vaccine Status By Age

Age Group	65 Cases Aseptic Meningitis				Paralytic Polio			
	0	1	2	3	0	1	2	3
0 - 4	1	0	1	2	2	0	0	1*
5 - 9	0	0	1	1	2	0	0	1*
10 - 14	2	0	0	9	1	0	0	0
15 - 19	1	0	0	2*	0	0	0	0
20 - 24	2	0	2	0	1	0	1	1
25 - 29	4	0	1	1	0	0	2	0
30 - 34	1	0	0	8	0			
35 - 39	1							
40 and Over	6	0	0	1	0			
Total	18	0	5	24*	4	0	3	3**
Percent	35.3	0.0	9.8	47.1	7.8	0.0	21.5	21.5
			45.1	54.9			78.5	

Inadequate immunization 47.2%

Inadequate immunization 92.9%

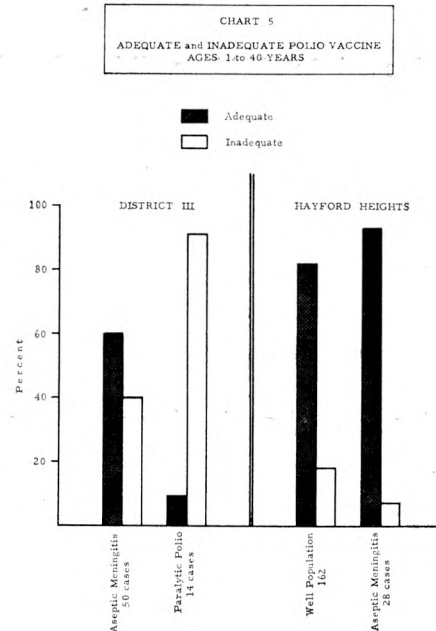
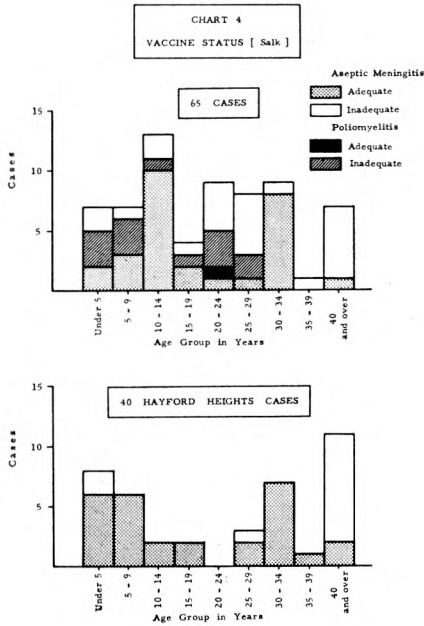
* One case with no inoculations since 1957

** Two cases with no inoculations since 1957

which epidemiologic investigation was made and the 40 cases from Hayford Heights will be found in Tables 2 and 3 and Charts 4 and 5. Adequate immunization in the case of the 65 cases was considered to be three or more inoculations of which one had been received in 1958. Three or more inoculations were considered

Table 3
Hayford Heights Survey

Age Group	Polio Vaccine Status By Age Groups																	
	235 Well Persons						40 Ill Persons						Total Population					
	0	1	2	3	4	Total	0	1	2	3	4	Total	0	1	2	3	4	Total
0 - 4	2	2	4	12	2	22	1		1	5	1	8	3	2	5	17	3	30
5 - 9				28		28				4	2	6			32	2	34	
10 - 14			1	19	1	21				2		2		1	21	1	23	
15 - 19	1			11		12				2		2	1		13		14	
20 - 24	1		2			3							1		2		3	
25 - 29	5		3	17		25		1	1	1	3	5		4	18	1	28	
30 - 34	9		3	25		37			6	1	7	9		3	31	1	44	
35 - 39	3			16	1	20				1		1	3		17	1	21	
40 and Over	47		4	16		67	7	1	1	2		11	54	1	5	18	78	
Total	68	2	17	144	4	235	8	1	3	23	5	40	76	3	20	167	275	
Percent	28.9	0.9	7.2	61.3	1.7		20.0	2.5	7.5	57.5	12.5		27.6	1.1	7.3	60.7	3.3	
1 - 40	20		10	128	4	162	1		1	21	5	28	21		11	149	190	
Percent	12.3		6.2	79.0	2.5		3.6		3.6	75.0	17.8		11.0		5.8	78.5	4.7	



adequate for the Hayford Heights cases, since no data were available as to time of last inoculation in these cases.

Only one case of paralytic disease was classified as having adequate immunization. This was a 21 year old woman who had bulbar polio and who now has minimal weakness of the left shoulder and slight difficulty with speech and deglutition. Complement fixation tests revealed infection with Polio I virus. There was no apparent relationship between immunization and aseptic meningitis. In fact, in the Hayford Heights cases, all of which were classified as aseptic meningitis, the immunization record of those between the ages of 1-40 was better than in the well population. This age range

was chosen to eliminate infants who had not had time to complete their immunization and older people who had not been advised to be inoculated.

Among the cases of aseptic meningitis are included cases of pleurodynia and pericarditis and one case of Guillan-Barre syndrome, since these cases were too few to warrant separate consideration.

Age-sex distributions as shown in Table I indicate a preponderance of males over females in both aseptic meningitis and poliomyelitis except that in Hayford Heights, the numbers were equally divided between the sexes.

Secondary attack rates are shown in Tables 4 and 5 both for aseptic meningitis and poliomyelitis. A strik-

Table 4
Secondary Attack Rates

Aseptic Meningitis					
Family Size	Number of Families	Number of Individuals	Number of Susceptibles	Secondary Cases	Secondary Attack Rates
1	(1)	(1)			
2	3	6	3	2	66.7
3	8	24	16	4	25.0
4	9	36	27	6	22.2
5	13	65	52	15	28.0
6	8	48	40	17	42.5
7	2	14	12	6	50.0
8	1	8	7	7	100.0
9	0	0	0	0	0.0
10	1	10	9	9	100.0
Total	45	211	166	66	39.9
				Wgt. Mean	35.7

Polio					
Family Size	Number of Families	Number of Individuals	Number of Susceptibles	Secondary Cases	Secondary Attack Rates
4	2	8	6	0	0.0
5	5	25	20	2	10.0
6	3	18	15	0	0.0
7	1	7	6	6	100.0
9	1	9	8	0	0.0
10	1	10	9	1	11.1
Total	13	77	64	9	14.1
				Wgt. Mean	12.4

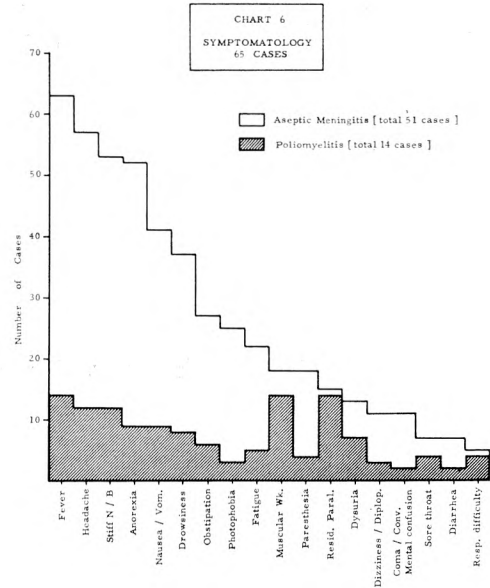
Hayford Heights					
Family Size	Number of Families	Number of Individuals	Number of Susceptibles	Secondary Cases	Secondary Attack Rates
2	4	8	4	1	25.0
3	4	12	8	4	50.0
4	6	24	18	5	27.8
5	5	25	20	11	55.0
Total	19	69	50	21	42.0
				Wgt. Mean	39.0

Table 5
Aseptic Meningitis and Polio Rates

County	Population in 100,000	Per County		District III	
		Aseptic Meningitis Cases	Aseptic Meningitis Rate	Polio Cases	Polio Rate
Kennebec	87.1	25	28.4	7	8.0
Knox	26.8	10	37.3	1	3.8
Lincoln	19.3	6	31.1	2	10.3
Sagadahoc	22.7	4	17.6	2	8.8
Waldo	22.0	2	9.1	1	4.5
Total	177.9	47	26.4	13	7.3

ing difference in attack rates was found in the families of these two groups. There were no secondary cases of paralytic disease but 9 persons out of 64 susceptibles had either gastroenteric disease, headache or backache, or a mean attack rate of 12.4 which corresponds closely to the mean rate of 11.4 among Aroostook families. In the 45 families of aseptic meningitis cases, there were 66 out of 166 susceptibles who had significant symptoms, or a mean rate of 35.7, nearly three times the rate in polio families. In Hayford Heights the rate was similar. There were 19 families with 50 susceptibles of which 21 developed symptoms giving a mean rate of 39.0. This indicates again that little immunity existed against the agent or agents causing aseptic meningitis.

Symptoms varied somewhat with the course of the outbreak. Early cases had aphthae of the lips, mouth and tonsils; several cases occurring in September or after had marked encephalitic signs such as convulsions, coma and mental confusion. One case diagnosed as Guillan-Barre syndrome was reported. Only one death occurred among the 65 cases studied by District III personnel. This was a 29 year old woman who had had two polio inoculations in 1957 and died of bulbar



polio on the third day of illness. Chart 6 gives a breakdown of chief symptoms in the 65 cases. Most symptoms were encountered about equally in the two types of cases with the exception that anorexia and photophobia were preponderantly found among the aseptic meningitis cases whereas muscular weakness, dysuria, sore throat and respiratory difficulty were present chiefly among the cases of poliomyelitis.

Table 5 shows the rate per 100,000 for each of the five counties for cases of aseptic meningitis and polio, on the basis of the 60 cases in District III. No attempt was made to calculate rates for individual towns.

Because of the lack of facilities for virus identification within the State, specimens had to be forwarded to the Public Health Service laboratories in Georgia. This entailed delivering material in a frozen state to Augusta, where it was repacked in dry ice and shipped by air freight to Georgia. Thus far, positive reports have been received on 46 down-state cases of which fifteen were Coxsackie B₂; two were Coxsackie B₃; three were Coxsackie B₅; one was ECHO 7 (isolated along with Polio III); one was ECHO 14; eleven were Polio I; and twelve were Polio III. In two cases the virus isolated could not be identified. No isolations of Polio II were made outside of Aroostook County. Five Polio I and three Polio III were isolated from cases with no paralysis. ECHO 9 virus, prevalent in 1958, was also not isolated. The case harboring ECHO 7 also had Polio III isolated from throat washings, and a significant rise in serum antibodies against Polio III. This man had typical pleurodynia and no evidence of paralysis despite total lack of Salk vaccine protection. His wife developed headache, fever, generalized muscular pain and has complained even after ten months of weakness of the back. No diagnosis has been made because no physician has been in attendance.

A few contacts between index cases are known. One

case of poliomyelitis in Waldo County was a neighbor of an Aroostook County case before moving to Northport shortly before onset. Two families in Hayford Heights were contacts of a family in Benton where three persons had aseptic meningitis. A family who visited in Waterville developed severe cases of aseptic meningitis soon after returning to Massachusetts early in October. Coxsackie B₂ virus was isolated from their stools.

This outbreak in the State of Maine has been a most interesting one to study because of its widespread nature and the marked differences in its characteristics between down-state and Aroostook County. No means

of spread other than by personal contact was determined. Apparently, the influx of large numbers of summer visitors was the reason for the widespread nature of the outbreak. Cases fell off sharply in October when tourists had returned to their homes.

REFERENCES

1. Labrack, Edson K., Poliomyelitis Immunization Status in Aroostook County — 1959, *Journal of the Maine Medical Association*, Vol. 51 p. 169, May, 1960.
2. Paralytic Poliomyelitis Case Rates by Vaccine Status, *Ibid.*, Vol. 51 p. 222, June, 1960.
3. Personal Communication from Marguerite C. Dunham, M.D., District VI Health Officer (Aroostook County).