

of *in vitro* studies, was at least as active as chloramphenicol against *H. influenzae*, and as penicillin G against the meningococcus and the pneumococcus. After initial *in vitro* studies of many isolates of *H. influenzae*, Type B, ampicillin was administered cautiously to patients with meningitis due to this organism who had been partially treated with chloramphenicol. Later, ampicillin was used as initial therapy in individuals not critically ill, providing satisfactory assurance of clinical efficacy and data concerning the diffusion of this drug into spinal fluid. (4,5) Concomitant and subsequent trials indicated that the clinical efficacy was similar to penicillin G in the treatment of both pneumococcal and meningococcal infections, and at least equivalent to chloramphenicol in *H. influenzae* Type B infections. (6,7,8,)

TABLE 3.—PNEUMOCOCCAL MENINGITIS—OUTCOME BY AGE AND SEVERITY OF ILLNESS, LOS ANGELES COUNTY GENERAL HOSPITAL, JULY 1963 TO JUNE 1966

Age group, years	Severity ¹ on admission to hospital						Total patients studied		
	Severe		Moderate ²		Mild ³				
	Total	Fatal	Total	Fatal	Total	Fatal	Cases	Deaths	Percent fatal
Under 1.....	8	1	7	3	10	0	25	4	16.0
1 to 15.....	14	6	0	0	23	0	38	6	15.8
15 to 29.....	5	0	1	0	7	0	13	0	0
30 to 44.....	15	10	2	1	6	1	23	12	52.2
45 to 59.....	24	9	0	0	9	1	33	10	30.3
60 plus.....	34	17	1	0	6	0	41	17	41.5
Total.....	101	43	11	4	61	2	173	49	28.3

¹ Severe equals coma, semicoma, significant hypotension or definite shock.

² Moderate equals convulsions.

³ Mild equals none of the above.

The present study includes patients admitted to our service between July 1st, 1965, and July 5, 1966. Therapy was provided using ampicillin in an initial rapid I.V. infusion of 50 mg per kg, followed by 150 mg per kg per day in six divided four-hourly rapid infusions. Alternate patients, selected on the basis of chart number, received two additional antimicrobial agents. These were chloramphenicol, 100 mg per kg per day, to a maximum of four grams each day for the total duration of therapy, and streptomycin, 40 mg kg per day (to a maximum of two grams) for the initial two days of treatment. The administration of each dose of chloramphenicol was delayed until 30 minutes after ampicillin had been administered in an effort to avoid antibiotic interference. Chloramphenicol was given by rapid I.V. infusion like the ampicillin. Streptomycin was given I.M. Both ampicillin and chloramphenicol were sometimes given I.M. at the I.V. dosage level to convalescent patients.

In table 4, the patients included in this evaluation are recorded by age group and by severity of illness at the time of admission to the hospital. In addition to the patients recorded in the table, a total of 15 infants less than two months of age were admitted during the study period. These infants have been excluded from analysis, since the organisms differed and initial treatment for meningitis in this age group was with either penicillin G or ampicillin plus kanamycin. This latter combination provides optimal initial therapy for organisms responsible for neonatal infections during recent years in our hospital.

Response to therapy for the two treatment routines is contrasted in table 5. The response to ampicillin given as a simple agent was excellent, with only 6 deaths among 145 patients treated, giving an overall case fatality rate of 4.1%. There were 14 deaths among 123 patients given multiple antibiotic treatment, a case fatality ratio of 11.4%. This difference is significant, ($X^2=5.01$; $p. \cong 0.02$). Although a few more patients receiving ampicillin were randomly included in the mild disease category, this chance shift is insufficient to explain the substantial difference in outcome observed.