

Combined Investigation of Central Nervous System Infection in Bangkok Children.

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OBJECTIVE: To determine the relative incidence of encephalitis occurring in Bangkok children, the spectrum of clinical disease, and etiological agents associated with the disease.

DESCRIPTION: At the present time essentially no information is available on the causes of CNS infections in the urban population of Bangkok. A number of arboviruses are known to be present, but their behavior with respect to this form of diseases is unknown. For example, instances of dengue hemorrhagic fever with CNS symptoms are not unusual, and the wide variety of ecological situations present in the sprawling metropolitan area of Bangkok potentially offers suitable microhabitats for a full range of mosquito vectors. At the same time the population is exposed to a very high infections force by enteroviruses known to be present as a result of the watery environment heavily contaminated by lack of developed sewage and refuse disposal systems. Finally, the syndrome of encephalopathy and fatty degeneration of the viscera is known to occur to an unknown extent in Bangkok, even though in northeastern Thailand this syndrome follows an almost exclusively rural distribution.

To evaluate these and other aspects of encephalitis, all children admitted to Children's Hospital with this admission diagnosis of aseptic meningitis or poliomyelitis were studied. History and physical examination data were recorded on a standard form, blood obtained for hematology, chemistries and acute sera, and specimens obtained for attempted virus isolation. A home visit was made the same day for family history, assessment of the environment and mosquito collection. In fatal cases, where possible, an autopsy was performed to obtain an anatomical diagnosis and tissue for virus isolation attempts. In survivors, convalescent sera were obtained for serological studies.

PROGRESS: During the period April 1969 to March 1970, 64 patients were admitted with a presumptive diagnosis of non-bacterial infections of the central nervous system. Twenty-four (38%) of these were fatal, but only eleven were autopsied. A paucity of clinical data, lack of information on hospital course,

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and limited number of clinical investigations also contribute to difficulties in establishing a definitive diagnosis. Fifty—eight were admitted with suspected encephalitis with only 6 admitted with aseptic meningitis and 2 with poliomyelitis. Other syndromes subsequently established (clinically) but initially diagnosed as encephalitis included febrile convulsions, infantile beri-beri, shigellosis, tuberculous meningitis, purulent meningitis and hepatic coma. Only 34 patients were from Bangkok—Thonburi, the remainder from outlying provinces as distant as Pitsanuloke and Mahasarakarn.

From analysis of admission history and physical examination, ten patients met the criteria as established for EFDV syndrome, outlined elsewhere in this report. Seven were from the metropolitan area. All ten died within two days of admission.

Only one arbovirus was isolated from mosquitoes collected in the homes from the homes of 21 encephalitis patients, that a dengue 2 isolated from Aedes aegypti. Of paired sera available on 20 patients two were positive for recent group B arbovirus infection. Neither were from the metropolitan area—one from Chachoengsao and the other from Samutprakarn and both were broadly reactive and not specific for JE virus. Paired sera were available from 17 family members of the patients in this series. Only one, the mother of a patient from Bangkok, showed evidence of recent infection with a group B arbovirus. Thus, evidence of arbovirus participation in CNS infections of Bangkok children is virtually negative.

CSF and throat and rectal swabs were received from all patients, as well as 63 specimens of tissue from the eleven autopsied cases. Twenty—four isolates were made from 17 patients, and are shown in Table VIII. An enterovirus etiology is thus suggested on at least nine of the patients. In addition, sera collected from 19 other patients showed an increase in poliovirus antibody in five patients: two to polio type 1, and 3 to polio type 2.

TABLE VIII. Virus isolates from patients with CNS infections.

Patient	Specimen	Isolate
21	RS	Unidentified enterovirus
27	RS	echo 17
45	CSF, brain, RS	unident, enterovirus
58	TS, RS	myxovirus
64	TS	CMV
65	RS	echo 22
73	TS	CMV
83	TS	unident. enterovirus
	RS	Coxsackie B3
104	RS, TS	unidentified
164	RS	echo 6
170	TS	unidentified
185	TS, RS, CSF	Coxsackie B4
227	RS	incomplete
299	RS	"
301	TS	"
181	TS	"
313	RS	"

RS = rectal swab ; TS = throat swab