NOTES

SEROLOGICAL STUDIES OF RADICULOMYELITIS OCCURRING DURING THE OUTBREAK OF ACUTE HEMORRHAGIC CONJUNCTIVITIS IN SENEGAL IN 1970

An extensive outbreak of acute hemorrhagic conjunctivitis (AHC) occurred in Senegal from September to November, 1970, as a part of its pandemic having started from Ghana in 1969 (Diallo et al., 1971; Kono, 1975). At that time a peculiar type of radiculomyelitis called local physicians' attention and sera from eight patients were saved for future testing for the possible causative agent. In the Indian outbreak of AHC in 1971, Wadia, Irani and Katrak (1973) described the same condition as those seen in Senegal as a complication of AHC. Later it was confirmed by Kono et al. (1974) that the sera of the patients had diagnostically significant levels of the neutralizing antibody to AHC virus. This note concerns with the neutralization tests of AHC virus with the patients' sera, the results of which indicate AHC virus etiology of radiculomyelitis in question.

Seven paired sera and one single serum were collected from eight patients of radiculomyelitis, whose clinical features are shown in Table I. They were sent to Japan to be tested for the neutralizing antibodies against AHC virus (enterovirus type 70) (Mirkovic et al., 1973).

As shown in Table I, most of the patients had prodromal symptoms comprising headache, slight fever and malaise 1 to 3 days before the onset of neurological illness, then they complained of root pain and weakness of the arms and legs. Characteristically all the patients showed paraplesia of the lower limbs, but the upper limbs were affected in lesser degree. Pleocytosis was found in four and increased CSF protein in three of the eight patients.

The method for the neutralization test of AHC virus (the J 670/71 strain) with patients' sera was described elsewhere (Kono et al., 1974) and the tests were performed in Kono's laboratory. The results of neutralization tests are shown also in Table I. Patient No. 1 showed a 4-fold rise in the neutralizing antibody titer at the convalescent stage from that at the acute stage. The cases Nos. 2, 3, 5 and 7 showed no rise but significantly high titers ranging from 1:32 to 1:128. No. 6 offered a single serum whose titer was 1:32. The cases Nos. 4 and 8 both had titers lower than 1:4 in the first and 1:4 in the second serum specimens. There was a slight rise in the antibody titer but it was considered diagnostically inconclusive.

Over-all serological results showed one confirmed and five probable cases of radiculomyelitis due to enterovirus 70 in the Senegalese epidemic of AHC in

TABLE I

Summary of clinical findings of patients with radiculomyelitis and the results of neutralization tests of AHC virus (EV70) with their sera

Clinical features	Patients							
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
Age (years)	39	19	25	25	45	36	56+	20
Sex	F	M	M	M	F	M	M	F
AHC	0	0	0	0	+	+	0	0
Interval between prodromal feverish illness and weakness	3 days	3 days	NI	1 day	3 weeks	3days	NI	1 day
Prodromal/Symptoms								
Headache	+	0	+	+	+	+	0	0
Fever	+	+	+	+	0	+	0	+
Malaise	+	+	+	+	0	+	0	+
Neurological Symptoms								
Root pain (lumbar)	+	+	+	+	0	+	0	+
(cervical)	+	0	+	0	+	+	0	+
Weakness								
Arms	+R	0	++ max R	0	++	++ max L	++	++
Legs	++	++ max L	++ max R	++	++ max L	+R	++ max R	++
Neurological Signs								
Neck stiffness	0	0	0	0	0	0	0	0
Straight leg raising test	±	±	?	+	?	?	0	0
Diminution of deep reflex								
Arms	0	+	0 L	+	0	0	0	NI
Legs	0	0	0	0	0	0	0	NI
Plantar reflex	nl	nl	nl	nl	nl	nl	nl	0
CSF								
Cells	62.6	1	13	75	49.8	1	1	1
Protein (mg/ml)	0.40	0.40	0.60	0.40	2.10	0.60	1	0.25
Neutralizing Antibody Titer Against EV70								
Serum at acute stage	64*	64	64	<4	32	32	128	<4
Serum at convalescent stage	256	64	32	4	64		128	4
Serological Diagnosis of EV70 Infection								
	Con- firmed	Prob- able	Prob- able	Equiv- ocal	Prob- able	Prob- able	Prob- able	Equiv- ocal

+ = present ± = present but slight ? = questionable 0 = not present ++ = both sides
 +R or +L = right side only or left side only ++ max R or max L = in both sides but maximum on the right or left side nl = normal

* Titer expressed by reciprocals of serum dilution

OL = No diminution on the right but it was on the left side NI = No information

1970. One important point is that the cases Nos. 5 and 6 had histories of AHC but others had no such record. As Wadia et al. (1973) pointed out in their clinical observation in the Bombay outbreak, it is likely that the relation between conjunctivitis and neurological disease was probably overlooked by both patients and physicians, for an interval of 2 to 4 weeks or more usually lapsed between two pathological conditions. Another possibility was that the conjunctivitis was sub-clinical and, hence, was unrecognized, but it does not seem the case in adults.

The peculiar type of radiculomyelitis appeared during the AHC outbreak and ceased with its decline. Clinical features of the disease are considered identical with those found in Bombay (Wadia et al., 1973), Bangkok (Phuapradit et al., 1976) and Taipei (Hung, Sung and Chang, 1975). It is also a common experience that most of the patients already had high titers of the neutralizing antibody to AHC virus when neurological signs and symptoms appeared, hence a significant antibody rise was found only in about 10% of paired sera collected from cases of radiculomyelitis (Sung, Hung and Green, 1975; Kono et al., 1976). Consequently, it is highly probable that the motor paralysis observed in Senegal in 1970 was due to enterovirus 70 infection.

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