

THE AETIOLOGIC AGENTS OF EPIDEMIC CONJUNCTIVITIS*

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SYNOPSIS

A new antigenic variant of Coxsackievirus type A24 gave rise to dramatic and explosive epidemics of acute conjunctivitis in Singapore in 1970.

A clinically similiar epidemic in the following year was found to be caused by enterovirus type 70.

Concurrent infections with adenovirus, Coxsackievirus type A24 and enterovirus type 70 followed in subsequent years with re-appearance of Coxsackievirus type A24 in 1975.

INTRODUCTION

In 1972, at the Fourth Congress of the Asia-Pacific Academy of Ophthalmology held in Auckland, New Zealand, we (Lim and Yin-Murphy, 1972) presented a paper entitled "Epidemic Conjunctivitis in Singapore in 1970 and 1971" and reported the first successful isolation of "an ether and acid resistant R.N.A. virus of less than 25 nm" from the 1970 epidemic in Singapore by Yin-Murphy (1972). The virus was later identified as a new type of picornavirus (Yin-Murphy, 1972) but its taxonomical position was unclear and we referred to it as the "Singapore Epidemic Conjunctivitis (1970) Virus". At the Fifth Congress of the Academy held in 1974 in Colombo, Sri Lanka, there was a presentation by our Indonesian colleagues, our present hosts, on this subject. The picornaviruses, as they turned out to be, had travelled widely (Leading Article: Lancet, 1973) and come around a full circle and, today, on the occasion of our Sixth Congress, a further chapter may be told.

An unprecedented epidemic infection of the eye which broke out in Africa in 1969 erupted through Asia in 1970 and by 1971, the pandemic spread was reported from many countries. The United States and Australia appeared to have escaped. The eye affliction, characterised by a sudden onset of sore eye, swollen eyelids, lacrimation, preauricular adenopathy, conjunctivitis of varying severity, and in some cases

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subconjunctival haemorrhage, was first recognised as a new entity in Singapore in 1970 (Lim and Yin-Murphy, 1971) where isolation of picornaviruses was reported (Yin-Murphy, 1972). Since then, recurrences of the epidemic were seen in the country which provided opportunities for further studies of the causative agents and disease.

OBSERVATIONS AND DISCUSSION

1970

The Singapore Epidemic Conjunctivitis (S.E.C.) 1970 virus responsible for the 1970 epidemic in Singapore has been classified as a "New antigenic variant of Coxsackievirus type A24" (Mirkovic, Schmidt, Yin-Murphy and Melnick, 1974). The S.E.C. 1970 (Coxsackievirus type A24) virus is probably the first human enterovirus incriminated in an epidemic disease with acute conjunctivitis as the dominant clinical feature. This virus was responsible for similar epidemics in Malaysia in 1970 and in Hong Kong together with enterovirus type 70 in 1971.

1971

A second epidemic which was clinically indistinguishable from that of 1970 occurred the following year. However, the causative agent was different from S.E.C. 1970 (Coxsackievirus type A24) virus. The S.E.C. 1971 virus together with virus isolated from similar epidemics in Morocco and in Japan in 1971 have now been classified as a new enterovirus "Enterovirus type 70" (Mirkovic, Kono, Yin-Murphy, Sohler, Schmidt and Melnick, 1973) and the disease "Acute Haemorrhagic Conjunctivitis". The enterovirus type 70 replaced and overshadowed the Coxsackievirus type A24 as agents of the new disease from 1971 to 1974 in Asia.

1972

Adenovirus type 11 dominated enterovirus type 70 in an epidemic of conjunctivitis in Singapore in 1972. With the exception of a higher incidence of keratitis, the clinical manifestations of the adenovirus type 11 conjunctivitis were similar to Coxsackievirus type A24 and enterovirus type 70 infections. An identical situation occurred in Taiwan at about the same time where workers also pointed to similarities in clinical manifestations observed in adenovirus type 11 and enterovirus type 70 infections.

1973 — 1974

Concurrent with small outbreaks of acute conjunctivitis caused by enterovirus type 70 in 1973 and enterovirus type 70 and Coxsackievirus type A24 in 1974 there were incidences of adenovirus types 7, 11 and 19 infections.

1975

The 1975 epidemic in Singapore was caused by the reappearance of S.E.C. 1970 (Coxsackievirus type A24) virus. The virulence of the virus was again manifested by its rapid and extensive spread in the country and by its epidemic spread to Malaysia, Brunei, Thailand, Bangladesh and Sri Lanka in the same year. This virus has regained the 'limelight' as the causative agent of epidemic conjunctivitis in Asia since June 1975.

In our study of epidemic conjunctivitis from 1970 to 1975 in Singapore, we observed that the new antigenic variant of Coxsackievirus type A24 gave rise to more dramatic and explosive epidemics of acute conjunctivitis involving a greater proportion of the population than enterovirus type 70. We believe that at least two agents, viz. the new antigenic

TABLE Outbreaks of Picomavirus Epidemic Conjunctivitis (AHC)

Year	Country	Causative Agent
1969	Africa	?
	Indonesia	?
1970	SINGAPORE	Coxsackievirus type A24
	MALAYSIA	Coxsackievirus type A24
1971	SINGAPORE	Enterovirus type 70
	MALAYSIA	Enterovirus type 70
	HONG KONG	Enterovirus type 70 & Coxsackievirus type A24
	MOROCCO	Enterovirus type 70
1972	JAPAN	Enterovirus type 70
	SINGAPORE	Enterovirus type 70
	MALAYSIA	Enterovirus type 70
	LONDON	Enterovirus type 70
1973	TAIWAN	Enterovirus type 70
	SINGAPORE	Enterovirus type 70
	INDONESIA	Enterovirus type 70
1974	SINGAPORE	Enterovirus type 70 & Coxsackievirus type A24
	MALAYSIA	Enterovirus type 70
	THAILAND	Enterovirus type 70
	SINGAPORE	Coxsackievirus type A24
	MALAYSIA	Coxsackievirus type A24
1975	BRUNEI	Coxsackievirus type A24
	BANGLADESH	Coxsackievirus type A24
	THAILAND	Coxsackievirus type A24
	SRI LANKA	Coxsackievirus type A24
	SRI LANKA	Coxsackievirus type A24

variant of Coxsackievirus type A24 and enterovirus type 70, possibly more, were involved in the 1969 to 1972 pandemic of acute conjunctivitis variously known as the "Apollo disease", "Epidemic Haemorrhagic Conjunctivitis", "Singapore Epidemic Conjunctivitis", "Picornavirus Epidemic Conjunctivitis" and "Acute Haemorrhagic Conjunctivitis" in Africa, Asia and England.

The authors would retain the term "Picornavirus Epidemic Conjunctivitis" in preference to "Acute Haemorrhagic Conjunctivitis" to encompass infections by both Coxsackievirus type A24 and enterovirus type 70, since they have not been able to differentiate clinically conjunctivitis caused by these two enterovirus. Furthermore, subconjunctival haemorrhage though striking, was seen in only a minority of cases examined in our study from year 1970 to 1975. The term "Picornavirus Epidemic Conjunctivitis" would allow for the slightly varied symptoms reported by some countries without weighing on a single feature — viz. the presence of subconjunctival haemorrhage. The term would in-

clude epidemic conjunctivitis caused by picornavirus irrespective of types and separate it from adenovirus epidemic conjunctivitis.

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