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Acute Hemorrhagic Conjunctivitis - Taipei City

In the fall of 1985, many cases of acute hemorrhagic conjunctivitis (AHC) were seen by ophthalmologists in the southern Taiwan Area. A review of cases seen at one private ophthalmology clinic in Kaohsiung City revealed that an outbreak had probably occurred during the first few weeks of October. Detailed clinical and epidemiologic data were unavailable. In May 1986, newspapers began reporting outbreaks of conjunctivitis in south-central Taiwan, and within one month, cases were occurring island-wide.

To better characterize this outbreak and identify potential control measures, we conducted an epidemiologic investigation of AHC cases seen at one large private ophthalmology clinic in Taipei City. This clinic, located in the Da An District, serves a middle to upper-middle income area with a population of approximately 300,000. Clinic records were reviewed from June 1 to August 23. During this period, a total of 2,120 new cases of AHC were seen (Figure 1). At the outbreak's peak during the first two weeks of July, more than 100 new cases per day were seen in just this one clinic. Nine other ophthalmology clinics in Taipei were contacted by telephone, and all reported seeing large numbers of patients with conjunctivitis during the June-August period.

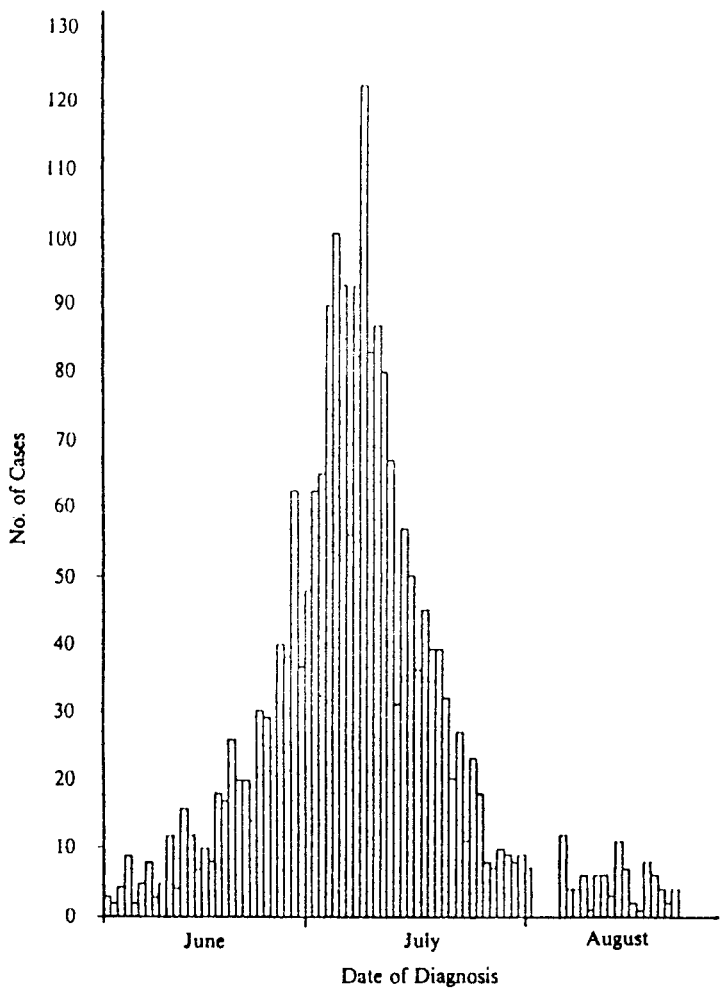
Detailed clinical information was obtained on 37 cases seen from July 15-17. Predominant signs and symptoms included conjunctival injection, foreign body sensation, and follicular reaction (Table 1). Preauricular adenopathy and subconjunctival hemorrhages were seen in about half of cases. Conjunctival scrapings from 6 of 9 patients were culture-positive for coxsackie virus neutralized by antisera to EH24, a variant of A24.

To determine the pattern of introduction of AHC into households and subsequent spread among family members, we collected detailed epidemiologic information on 101 AHC clinic patients and their household contacts. Among the 101 households studied, 229 (47%) of 488 persons had illness compatible with AHC. Eighty-six (86%) of the 101 households had one or more children ≤18 years of age. Among these households, school-age children were more likely to be household index cases than adult or pre-school age family members (Table 2). Males were also more likely to be household index cases than females (Table 3). After illness was introduced into households, it spread equally among family members of both sexes and among all age groups; the secondary attack rate for

both males and females was 33%, and for preschool children, school-age children, and adults, was 40%, 41%, and 30%, respectively. To identify other factors contributing to the spread of illness in households, we compared single (N=35) and multiple case households (N=64). In multiple case households there was more crowding (3.0 versus 2.5 persons per bathroom; $p<0.05$, Wilcoxon Rank Sum Test) and illness was introduced by younger family members (median age of index case=10 versus 17 years; $p<0.01$, Wilcoxon Rank Sum Test).

We conclude from this investigation that a large outbreak of AHC occurred in Taipei City during the summer months of 1986. The Taipei outbreak was due to coxsackie virus EH24, a variant of A24. School-age children, especially school-age boys, tended to introduce the illness into households. AHC may have spread more easily among school-age boys because of more physical contact during play. Contact with fomites such as bas-

Figure 1. Number of cases of conjunctivitis per day seen at one ophthalmology clinic in Taipei City, June 1 to August 23, 1986.



ketballs, baseballs, etc., may also have been important. Once introduced into households, secondary transmission occurred equally among males and females and among all age groups, suggesting relatively uniform exposure rates within the household.

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Editorial Note: AHC is a clinically distinct and highly contagious type of viral conjunctivitis characterized by subconjunctival hemorrhages, follicle reaction, lacrimation and lid edema. AHC was first described in Ghana, West Africa in 1969 and was called Apollo 11 disease by local residents who thought it was associated with the first lunar landing[1]. The disease spread quickly throughout Africa, and followed trade routes to India and Asia causing widespread pandemics by the early 1970's[2]. In 1971, enterovirus 70 (EV70) was shown to be the virus associated with most of the large epidemics of AHC[3]; however, coxsackie A24 was later isolated from cases that were clinically indistinguishable[4].

The first outbreak of AHC in Taiwan was reported in 1971[5]. During this outbreak, both EV70 and adenovirus 11 were isolated. Another large outbreak occurred in 1980, and the predominant serotype was adenovirus 8, although several other serotypes were also isolated[6]. The pattern of AHC transmission described in the present outbreak is similar to that found in many other countries: illness spreads quickly among school-age children, and attack rates are higher among crowded households. The importance of school-age children in the introduction of AHC into households has been previously reported, and school-based active surveillance and exclusion of symptomatic children from school has some effect in limiting the spread of community outbreaks[7,8]. At the time of the Taipei City outbreak, school was closed for summer vacation, however, many school-age children reported onset of illness occurred during summer activities sponsored by schools such as

Table 1. Signs and symptoms of 37 cases of conjunctivitis seen at one ophthalmology clinic in Taipei City from July 15-17, 1986.

Signs and Symptoms	No. Patients	(%)
Conjunctival injection	37	(100)
Foreign body sensation	29	(78)
Follicle formation	28	(76)
Bilateral involvement	26	(70)
Palpebral edema	26	(70)
Blurred vision	21	(57)
Lacrimation	20	(54)
Preauricular adenopathy	17	(46)
Subconjunctival hemorrhage	16	(43)
Photophobia	15	(40)
Keratitis	10	(27)