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Adenovirus Type 7 Outbreaks in Japan in 1998

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Japan experienced a large adenovirus 7 epidemic in 1950 (1). Signs of its resurgence have been noted since 1995 (2). We report here the analysis of adenovirus 7 epidemics in Japan from 1997-1998.

In 1998, adenovirus 3 occupied 50% of the total adenovirus isolated that year. Adenovirus 7 was the third most frequent adenovirus infection observed. It occupied 11% of the total isolates (Table 1). Serious complications of adenovirus 7 infection, such as meningitis and encephalitis, were observed. The major clinical signs were inflammation of upper respiratory tract, gastroenteritis, keratoconjunctivitis, and inflammation of lower respiratory tract (Table 2). Keratoconjunctivitis was more common in outbreak cases. However, the general symptoms were reportedly less severe in outbreak cases.

There were 40 outbreaks in 1997 and 27 in 1998. Outbreaks were most frequent in summer seasons and relatively rare in winter. In 1997, outbreaks occurred mainly in June-August, but there was a small peak of outbreaks from December to February, 1998. In 1998, the outbreak was clustered in April-June, and none were reported in August. A small peak of outbreaks were seen in September-November of that year (Fig.).

Instances of adenovirus 7 were most commonly detected by family members (63% in 1997 and 67% in 1998). In regard to site of outbreak, nursery schools and kindergartens constituted 30% in 1997 (each 15%), while in 1998 primary schools constituted 26% (Table 3). Though the average age of the patients in the outbreaks and that in the sporadic cases were similar in 1997, the average age of outbreak cases was slightly

higher than that of sporadic cases in 1998.

Table 1. Adenovirus isolates in 1998

Adenovirus type	% total
1	10
2	16
3	50
4	1
5	5
6	1
7	11
8	0.5
11	0.4
19	3
40/41	2

Table 2. Clinical symptoms of adenovirus 7 infection (1998)

Inflammation of upper respiratory tract	37 (%)
Gastroenteritis	19
Keratoconjunctivitis	14
Inflammation of lower respiratory tract	13
Meningitis	3
Joint and muscular pain	2
Enlargement of lymph nodes	2
Encephalitis	0.3
Others	11

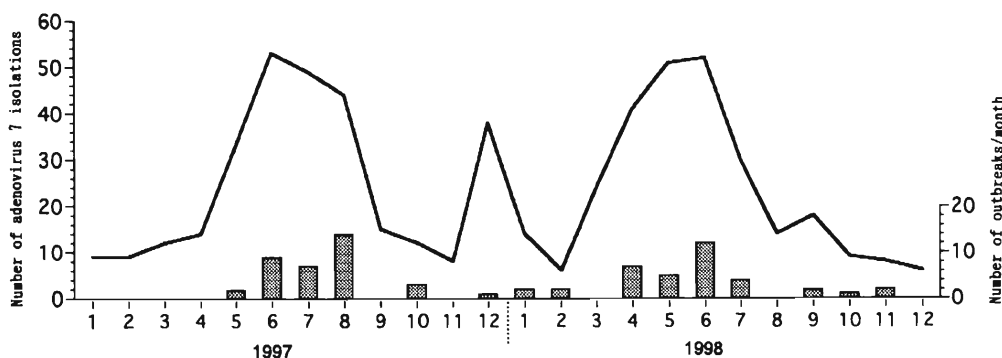


Figure. Isolations and outbreaks of adenovirus 7 in 1997-1998. The line graph shows the number of adenovirus 7 isolations per month, while the bar graph shows the number of outbreaks per month.

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Table 3. Places of detection of patients

	1997	1998
Family	63 (%)	67 (%)
Primary School	5	26
Nursery School	15	7
Kindergarten	15	0
Hospital	3	0

Schools, hospitals, and other institutional sites appear to play an important role in the spread of adenovirus 7. In 1997, the adenovirus 7 infection which started in a nursery school spread to families and then to the primary schools (3). In 1998, the adenovirus 7 infection spread to families in spite of closure of the classes in the primary school affected (4). Hospital infection was also noticed (personal communication), while some patients with congenital diseases were reported to have died (5). Recently, a large outbreak occurred in a training center in the U.S.A., with 60% of the people infected with adenovirus 11 (6). As adenovirus 7 sometime causes symptoms more serious than influenza, adequate measures in nursery schools, primary schools, and hospitals are needed for preventing the spread of the infection.

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